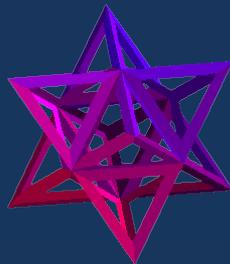


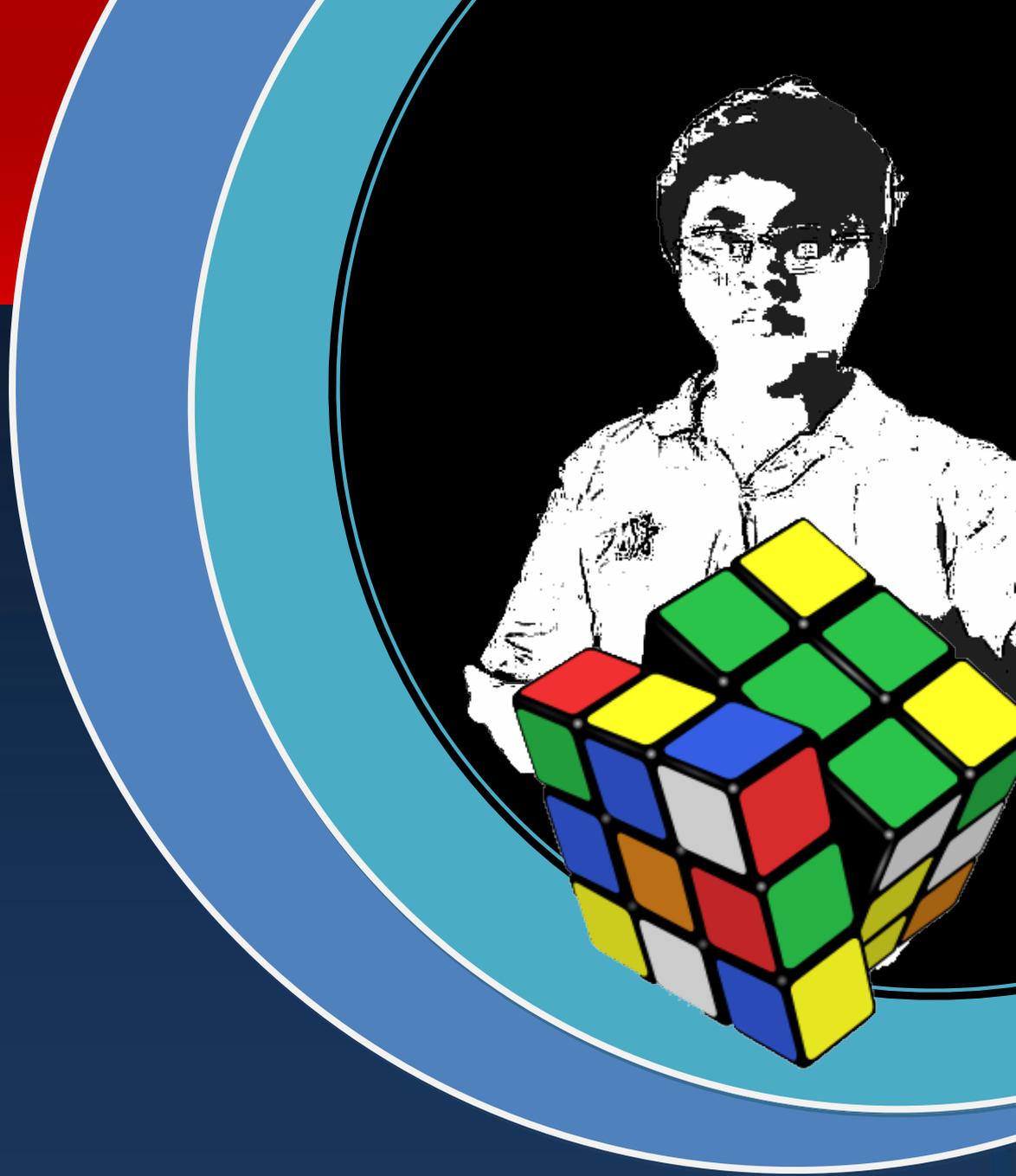
Trigonometry Workbook

Basic Step of Trigonometry Function

- Quadrant
- Radian Measure
- Degree Measure
- Co-terminal Angle
- Arc Length
- Indicated Trigonometric Ratio
- Working with Right Triangle
- Solving Problems



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Thoeng Chiangrai



Trigonometry Workbook

Vol. 1

A. Chuwai

State the quadrant in which the terminal side of each angle lies.

1) 225°

2) 204°

3) -155°

4) 255°

5) 20°

6) 280°

7) -241°

8) 330°

9) 80°

10) 105°

11) 104°

12) 155°

13) 357°

14) -123°

15) 135°

16) -335°

17) -35°

18) 100°

19) -125°

20) 150°

21) 240°

22) -195°

23) -254°

24) 29°

25) -210°

26) 40°

27) -294°

28) 50°

29) -145°

30) 339°

31) -60°

32) -130°

33) 210°

34) 26°

35) -40°

36) -121°

37) 190°

38) 325°

39) -273°

40) -230°

41) 220°

42) -126°

43) -245°

44) 115°

45) -280°

46) -283°

47) 235°

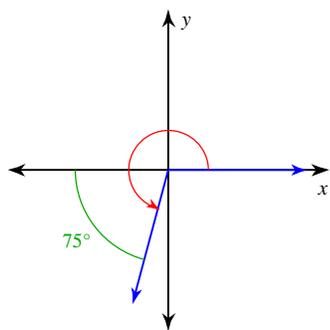
48) 261°

49) 10°

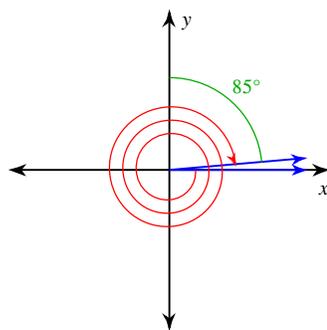
50) -120°

Find the measure of each angle.

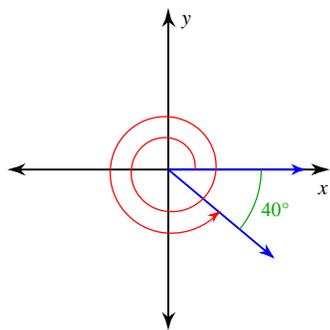
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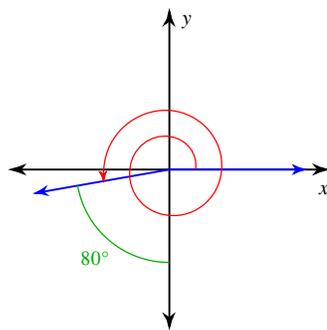
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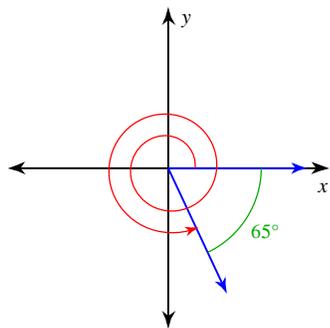
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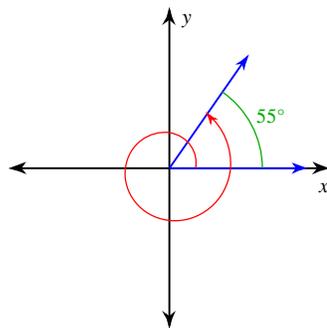
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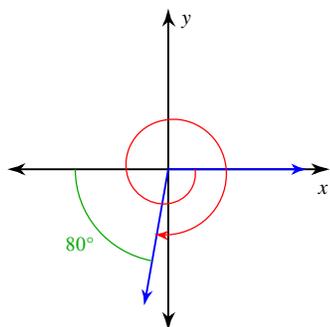
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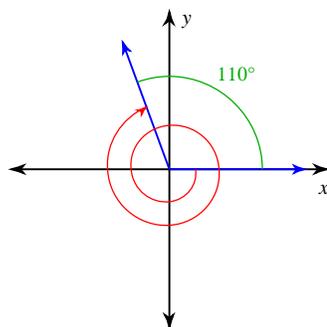
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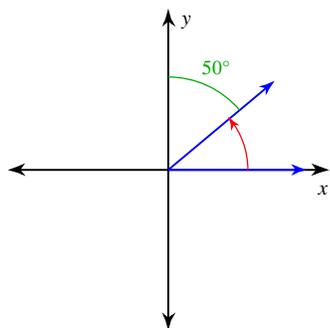
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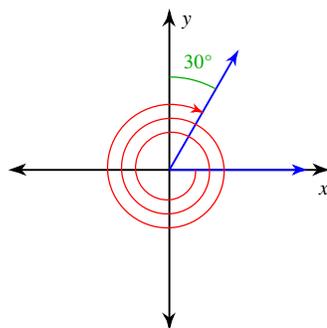
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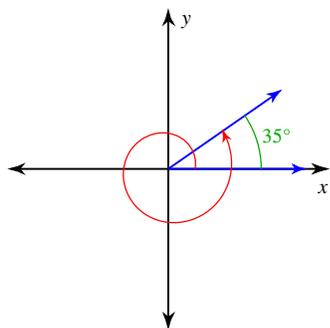
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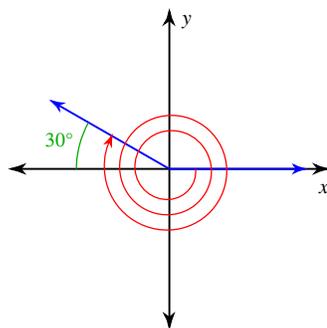
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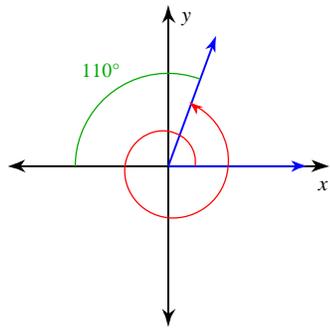
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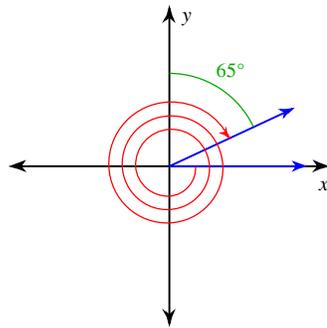
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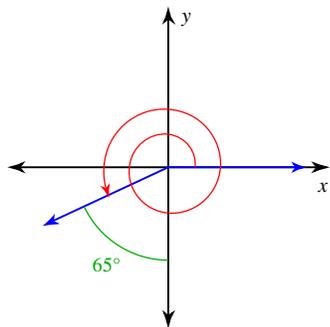
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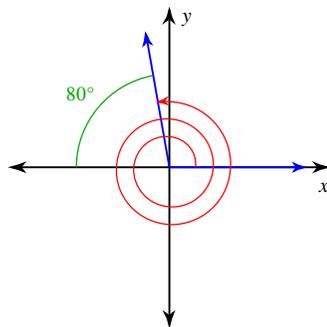
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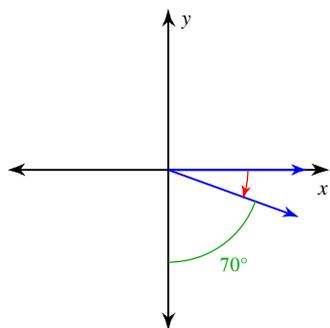
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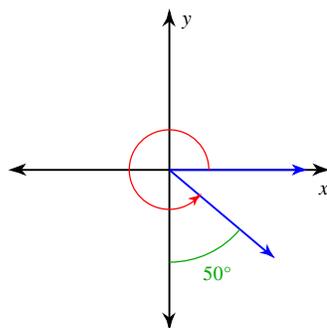
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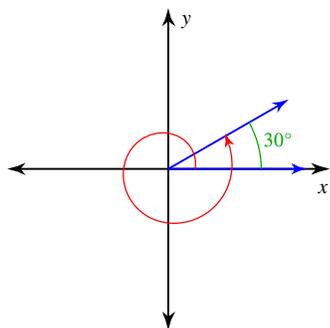
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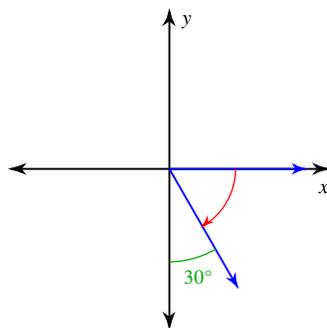
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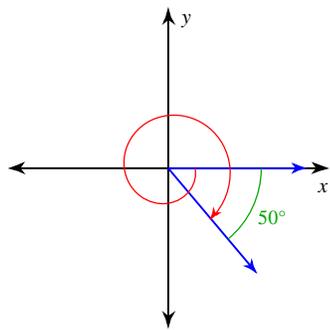
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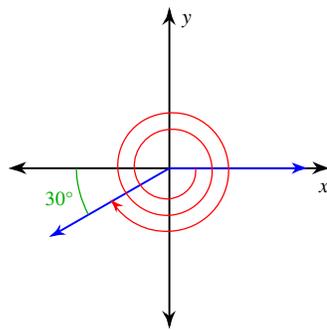
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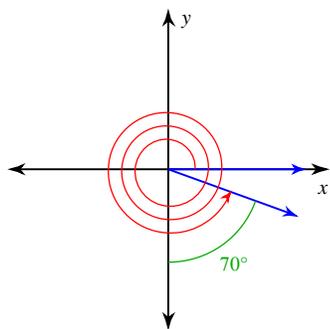
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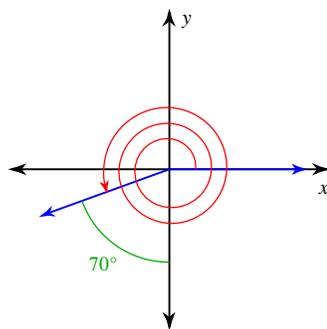
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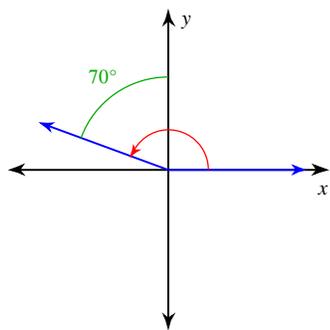
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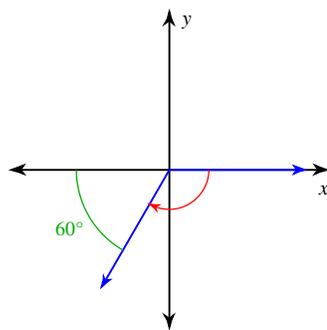
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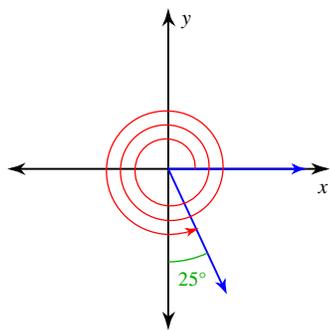
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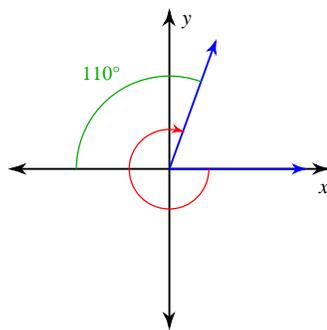
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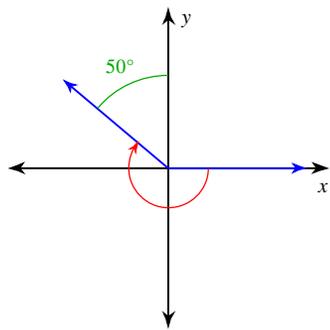
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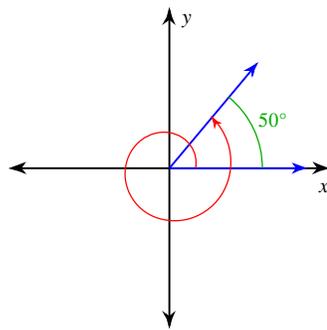
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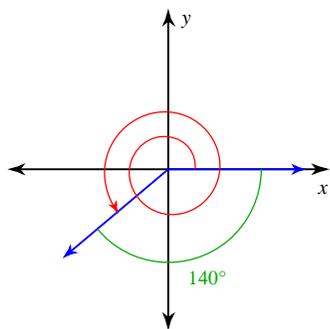
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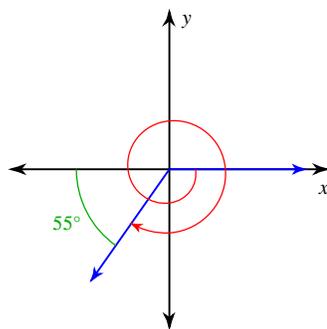
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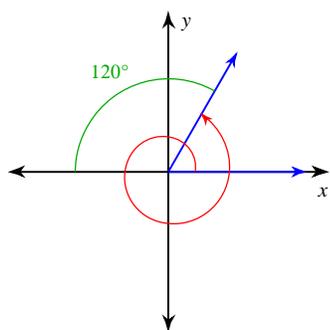
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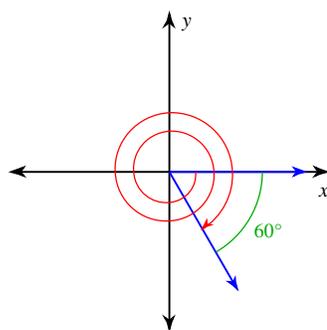
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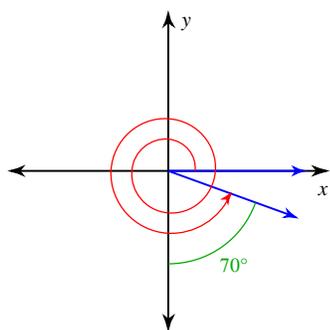
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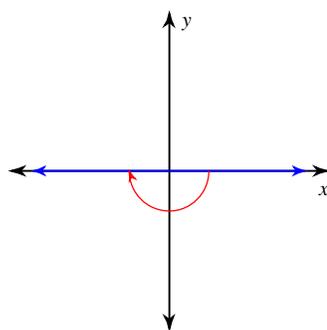
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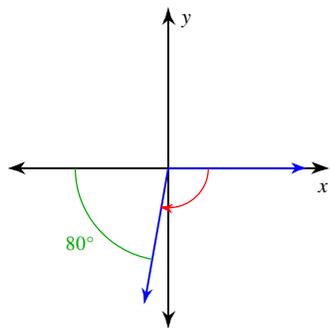
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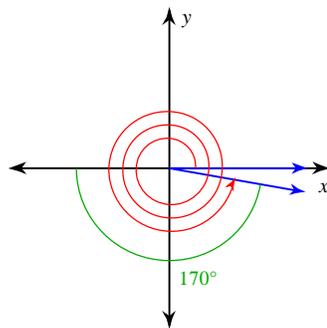
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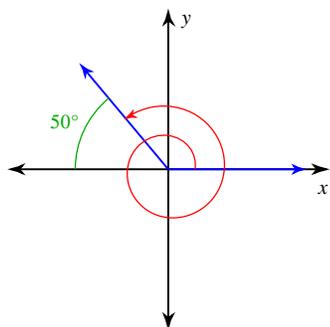
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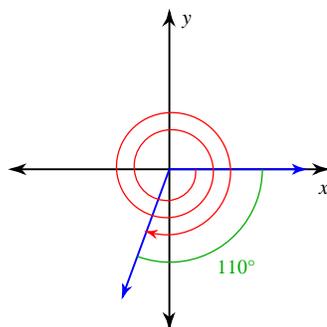
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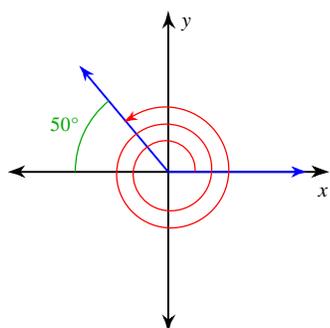
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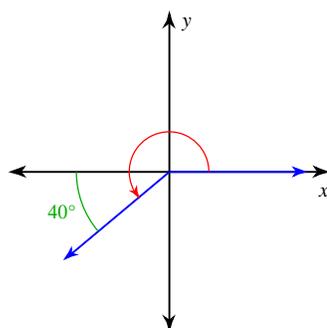
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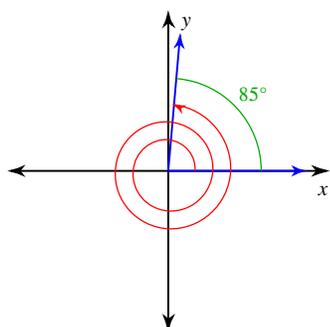
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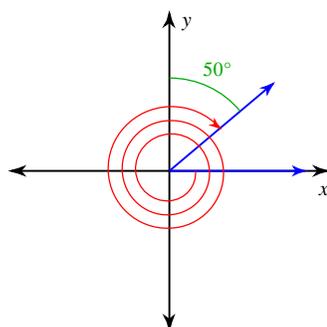
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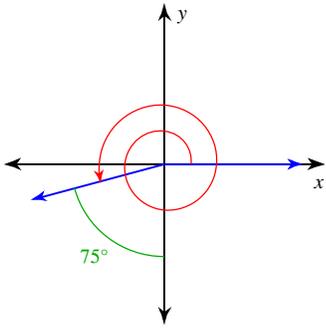
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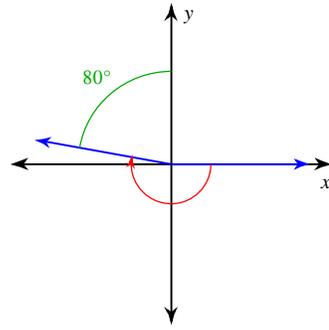
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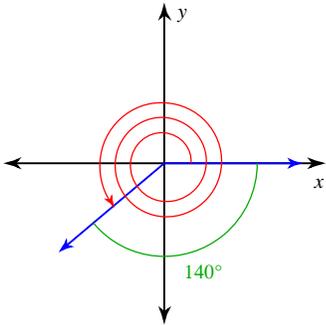
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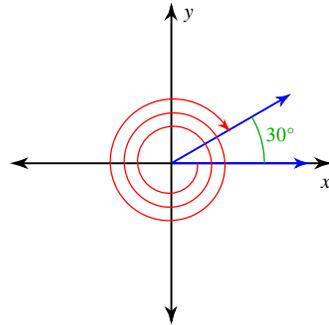
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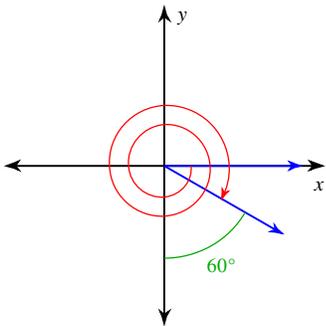
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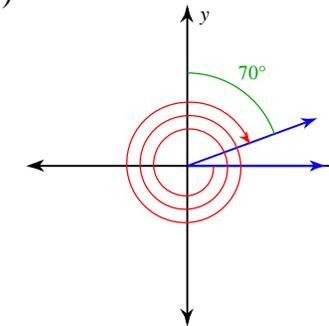
98)



99)



100)



Find the reference angle.

101) $-\frac{10\pi}{3}$

102) $-\frac{47\pi}{18}$

103) $\frac{5\pi}{6}$

104) $-\frac{19\pi}{18}$

105) $\frac{17\pi}{6}$

106) $\frac{55\pi}{18}$

107) $\frac{34\pi}{9}$

108) $-\frac{23\pi}{9}$

$$109) -\frac{11\pi}{9}$$

$$110) \frac{17\pi}{9}$$

$$111) -\frac{17\pi}{6}$$

$$112) -\frac{7\pi}{3}$$

$$113) \frac{19\pi}{18}$$

$$114) -\frac{26\pi}{9}$$

$$115) -\frac{19\pi}{6}$$

$$116) \frac{7\pi}{3}$$

$$117) -\frac{13\pi}{6}$$

$$118) \frac{29\pi}{18}$$

$$119) -\frac{25\pi}{12}$$

$$120) -\frac{7\pi}{9}$$

$$121) \frac{9\pi}{4}$$

$$122) \frac{11\pi}{18}$$

$$123) \frac{8\pi}{9}$$

$$124) -\frac{15\pi}{4}$$

$$125) -\frac{31\pi}{18}$$

$$126) -\frac{3\pi}{4}$$

$$127) -\frac{71\pi}{18}$$

$$128) -\frac{5\pi}{3}$$

$$129) -\frac{7\pi}{6}$$

$$130) \frac{13\pi}{4}$$

$$131) -\frac{14\pi}{9}$$

$$132) -\frac{13\pi}{9}$$

133) $-\frac{11\pi}{12}$

134) $\frac{19\pi}{6}$

135) $\frac{28\pi}{9}$

136) $-\frac{25\pi}{9}$

137) $-\frac{23\pi}{6}$

138) $-\frac{11\pi}{6}$

139) $\frac{11\pi}{12}$

140) $-\frac{32\pi}{9}$

141) $-\frac{5\pi}{9}$

142) $\frac{8\pi}{3}$

143) $-\frac{5\pi}{4}$

144) $\frac{11\pi}{6}$

145) $\frac{35\pi}{9}$

146) $-\frac{5\pi}{6}$

147) $-\frac{35\pi}{9}$

148) $\frac{29\pi}{12}$

149) $\frac{43\pi}{18}$

150) $\frac{11\pi}{3}$

Convert each degree measure into radians.

151) 260°

152) 150°

153) 200°

154) 30°

155) 285°

156) 165°

157) 240°

158) 50°

159) 65°

160) 220°

161) 90°

162) 125°

163) 115°

164) 15°

165) 55°

166) 140°

167) 340°

168) 5°

169) 60°

170) 345°

171) 245°

172) 135°

173) 270°

174) 105°

175) 335°

176) 265°

177) 300°

178) 130°

179) 320°

180) 75°

181) 315°

182) 85°

183) 350°

184) 145°

185) 120°

186) 170°

187) 195°

188) 230°

189) 80°

190) 45°

191) 190°

192) 280°

193) 225°

194) 215°

195) 40°

196) 290°

197) 330°

198) 210°

199) 255°

200) 310°

Convert each degree measure into radians and each radian measure into degrees.

201) -50°

202) $\frac{5\pi}{3}$

203) $\frac{5\pi}{4}$

204) 120°

205) 70°

206) 105°

207) 170°

208) $\frac{11\pi}{9}$

209) $-\frac{29\pi}{6}$

210) -140°

211) $-\frac{3\pi}{2}$

212) 150°

213) $\frac{4\pi}{3}$

214) 90°

215) $-\frac{17\pi}{3}$

216) $-\frac{\pi}{3}$

217) $-\frac{19\pi}{12}$

218) $-\frac{14\pi}{3}$

219) $\frac{16\pi}{9}$

220) $\frac{10\pi}{9}$

221) $\frac{7\pi}{12}$

222) -300°

223) $\frac{2\pi}{3}$

224) $\frac{7\pi}{2}$

225) 420°

226) $-\frac{95\pi}{36}$

227) 300°

228) 270°

229) -600°

230) 195°

231) -210°

232) 640°

233) -285°

234) -240°

235) $\frac{\pi}{4}$

236) $-\frac{16\pi}{3}$

237) $\frac{37\pi}{12}$

238) 165°

239) 315°

240) $\frac{61\pi}{12}$

241) $-\frac{3\pi}{4}$

242) 330°

243) $-\frac{17\pi}{6}$

244) 60°

245) $\frac{35\pi}{36}$

246) 945°

247) 10°

248) 205°

249) 510°

250) 680°

Convert each radian measure into degrees.

251) $\frac{9\pi}{4}$

252) $\frac{21\pi}{4}$

$$253) -\frac{4\pi}{3}$$

$$254) \frac{5\pi}{2}$$

$$255) \frac{17\pi}{18}$$

$$256) \frac{13\pi}{12}$$

$$257) \frac{5\pi}{18}$$

$$258) \frac{17\pi}{3}$$

$$259) \frac{15\pi}{4}$$

$$260) -\frac{13\pi}{12}$$

$$261) \frac{\pi}{6}$$

$$262) -\frac{8\pi}{3}$$

$$263) -\frac{15\pi}{4}$$

$$264) -\frac{7\pi}{18}$$

$$265) -\frac{11\pi}{6}$$

$$266) -\frac{17\pi}{12}$$

$$267) \frac{5\pi}{4}$$

$$268) \frac{5\pi}{3}$$

$$269) -\frac{5\pi}{3}$$

$$270) \frac{31\pi}{12}$$

$$271) -\frac{10\pi}{3}$$

$$272) -\frac{3\pi}{4}$$

$$273) \frac{\pi}{3}$$

$$274) -\frac{2\pi}{3}$$

$$275) \frac{7\pi}{12}$$

$$276) \frac{19\pi}{12}$$

$$277) -\frac{7\pi}{6}$$

$$278) -\frac{7\pi}{2}$$

$$279) \frac{8\pi}{3}$$

$$280) -\frac{37\pi}{12}$$

$$281) -\frac{37\pi}{18}$$

$$282) \frac{5\pi}{9}$$

$$283) \frac{85\pi}{36}$$

$$284) -\frac{\pi}{2}$$

$$285) \frac{7\pi}{9}$$

$$286) -\frac{67\pi}{18}$$

$$287) \frac{145\pi}{36}$$

$$288) \frac{11\pi}{3}$$

$$289) -\frac{5\pi}{6}$$

$$290) \frac{11\pi}{6}$$

$$291) -2\pi$$

$$292) \frac{23\pi}{18}$$

$$293) \frac{5\pi}{6}$$

$$294) \frac{53\pi}{12}$$

$$295) \frac{20\pi}{9}$$

$$296) -\frac{5\pi}{4}$$

$$297) \frac{3\pi}{4}$$

$$298) -\frac{14\pi}{3}$$

$$299) \frac{11\pi}{18}$$

$$300) -\frac{29\pi}{18}$$

State if the given angles are coterminal.

301) 40° , -680°

302) 270° , 630°

303) 125° , -485°

304) 150° , -210°

305) 80° , 800°

306) 315° , -45°

307) 135° , 855°

308) 20° , -380°

309) 165° , 885°

310) 290° , 830°

311) 135° , 495°

312) 285° , 645°

313) 140° , -400°

314) 315° , -225°

315) 300° , -240°

316) 155° , -45°

317) 335° , 1055°

318) 235° , -125°

319) 255° , -105°

320) 170° , 530°

321) 165° , -375°

322) 175° , -185°

323) 60° , 600°

324) 50° , 250°

325) 125° , 225°

326) 35° , -395°

327) 340° , 1060°

328) 25° , 385°

329) 20° , -700°

330) 165° , 525°

331) 325° , -35°

332) 185° , 725°

333) 170° , 890°

334) 55° , 415°

335) 5° , -365°

336) 80° , -280°

337) $205^\circ, 745^\circ$

338) $335^\circ, -695^\circ$

339) $70^\circ, -290^\circ$

340) $340^\circ, -20^\circ$

341) $305^\circ, -235^\circ$

342) $165^\circ, 365^\circ$

343) $305^\circ, -665^\circ$

344) $110^\circ, 650^\circ$

345) $150^\circ, -510^\circ$

346) $170^\circ, -130^\circ$

347) $110^\circ, 470^\circ$

348) $45^\circ, 405^\circ$

349) $315^\circ, 675^\circ$

350) $185^\circ, -535^\circ$

Find a coterminal angle between 0° and 360° .

351) -570°

352) 960°

353) 555°

354) -85°

355) 470°

356) -512°

357) -70°

358) -145°

359) -345°

360) -415°

361) 575°

362) 718°

363) 525°

364) -435°

365) -225°

366) 750°

367) -395°

368) 480°

369) -46°

370) -285°

371) -255°

372) 570°

373) 490°

374) -540°

375) 635°

376) 666°

377) -185°

378) -45°

379) 705°

380) -315°

381) 365°

382) 448°

383) -292°

384) -135°

385) 966°

386) -615°

387) -150°

388) 840°

389) 765°

390) 510°

391) 446°

392) 965°

393) -30°

394) -90°

395) -212°

396) -242°

397) -470°

398) -268°

399) 915°

400) 762°

Find a positive and a negative coterminal angle for each given angle.

401) $-\frac{7\pi}{4}$

402) $-\frac{103\pi}{90}$

403) $-\frac{\pi}{12}$

404) $-\frac{71\pi}{36}$

405) $-\frac{\pi}{4}$

406) $-\frac{7\pi}{12}$

407) $\frac{3\pi}{2}$

408) $\frac{\pi}{9}$

409) $\frac{5\pi}{6}$

410) $\frac{17\pi}{6}$

411) $\frac{37\pi}{18}$

412) $\frac{10\pi}{3}$

413) $\frac{13\pi}{45}$

414) $-\frac{23\pi}{12}$

415) $-\frac{3\pi}{4}$

416) $-\frac{67\pi}{90}$

417) $-\frac{47\pi}{36}$

418) $-\frac{17\pi}{12}$

419) $-\frac{5\pi}{4}$

420) $\frac{19\pi}{12}$

421) $-\frac{121\pi}{90}$

422) $-\frac{31\pi}{12}$

423) $\frac{2\pi}{3}$

424) $\frac{14\pi}{9}$

425) $\frac{29\pi}{9}$

426) 2π

427) $-\frac{5\pi}{12}$

428) $-\frac{29\pi}{9}$

429) $\frac{64\pi}{45}$

430) $\frac{31\pi}{9}$

431) $\frac{5\pi}{4}$

432) $\frac{4\pi}{3}$

433) $\frac{23\pi}{18}$

434) $\frac{5\pi}{2}$

435) $-\frac{7\pi}{18}$

436) $\frac{11\pi}{6}$

437) $-\frac{5\pi}{6}$

438) $-\frac{101\pi}{90}$

439) $\frac{31\pi}{36}$

440) $-\frac{15\pi}{4}$

441) $-\frac{35\pi}{18}$

442) 0

443) $\frac{11\pi}{12}$

444) $\frac{13\pi}{9}$

445) $\frac{55\pi}{36}$

446) $-\frac{26\pi}{9}$

447) $\frac{7\pi}{6}$

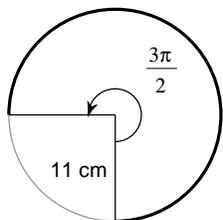
448) $\frac{118\pi}{45}$

449) $-\frac{19\pi}{12}$

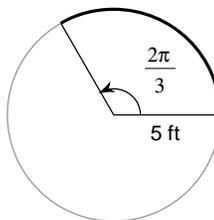
450) $-\frac{11\pi}{6}$

Find the length of each arc. Round your answers to the nearest tenth.

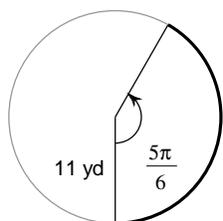
451)



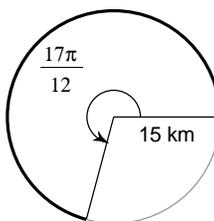
452)



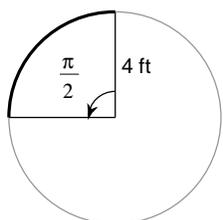
453)



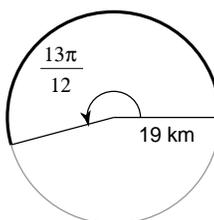
454)



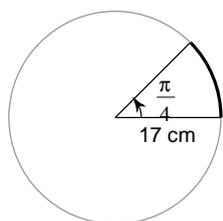
455)



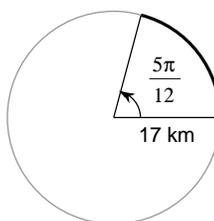
456)



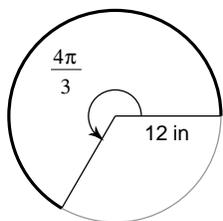
457)



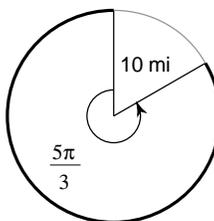
458)



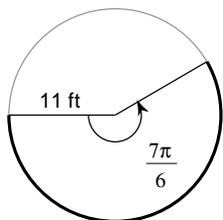
459)



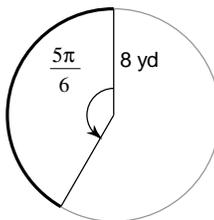
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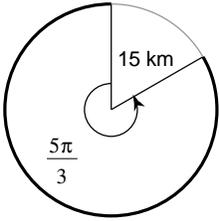
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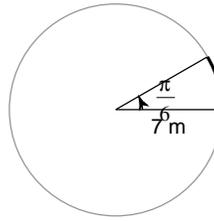
462)



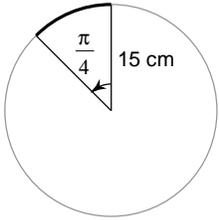
463)



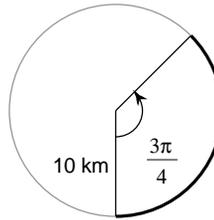
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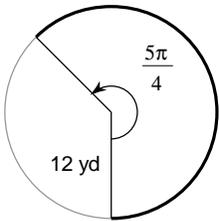
465)



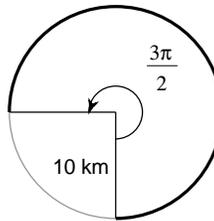
466)



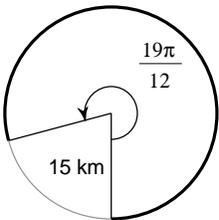
467)



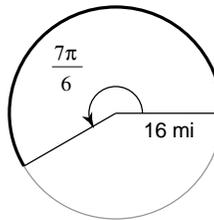
468)



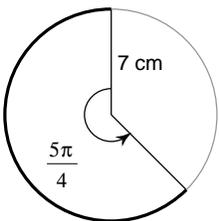
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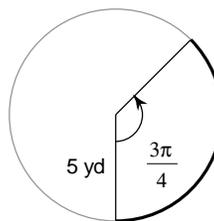
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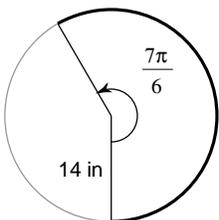
471)



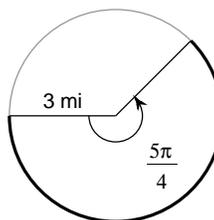
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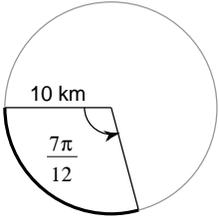
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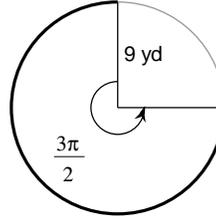
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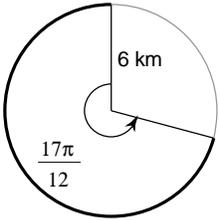
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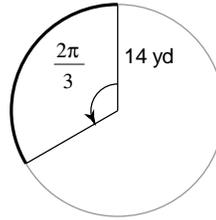
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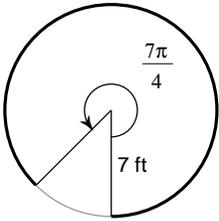
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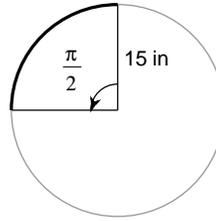
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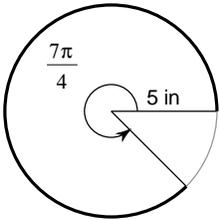
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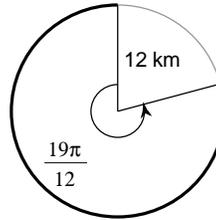
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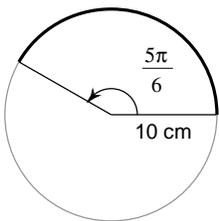
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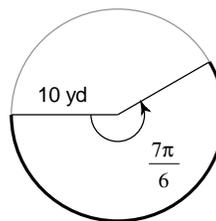
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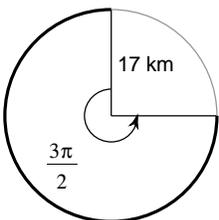
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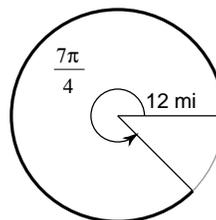
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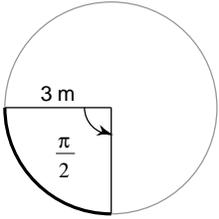
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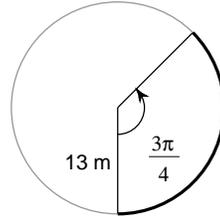
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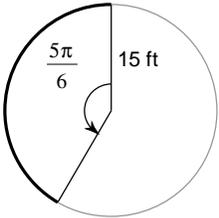
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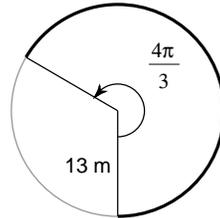
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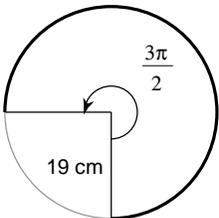
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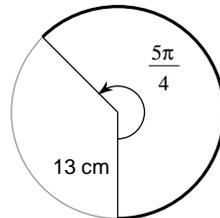
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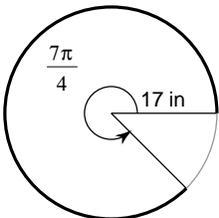
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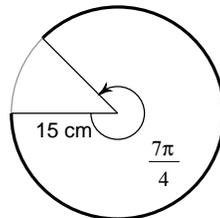
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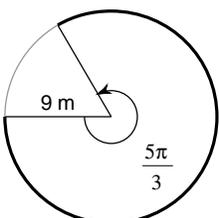
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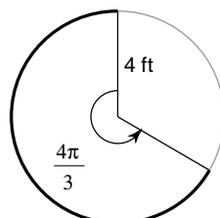
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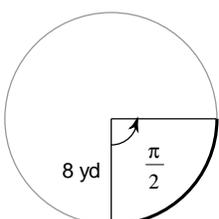
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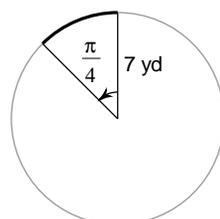
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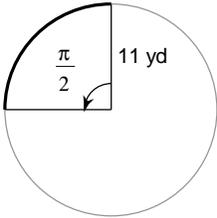
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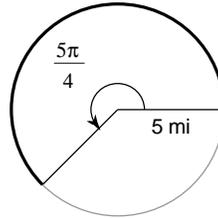
498)



499)

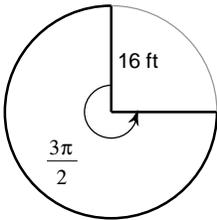


500)

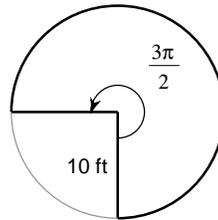


Find the area of each sector.

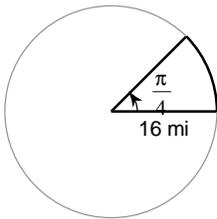
501)



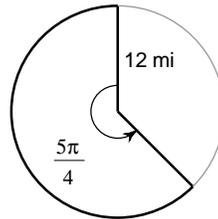
502)



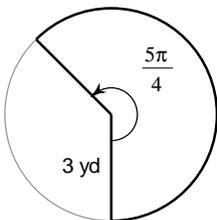
503)



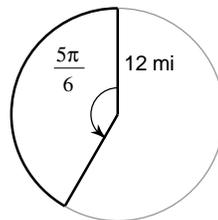
504)



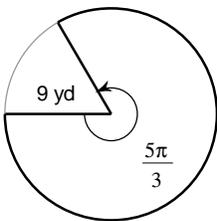
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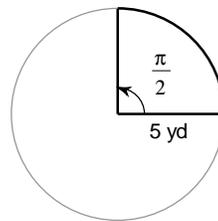
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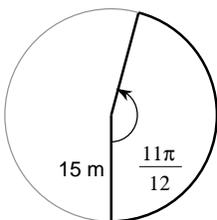
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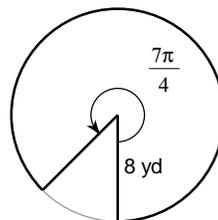
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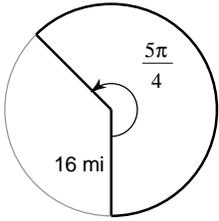
509)



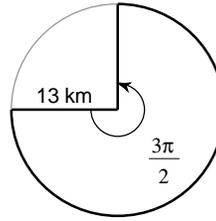
510)



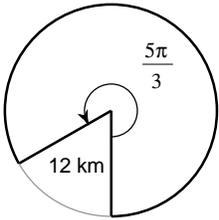
511)



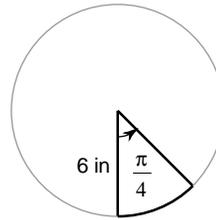
512)



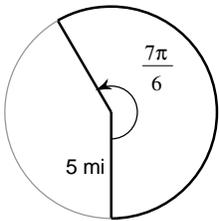
513)



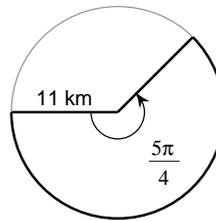
514)



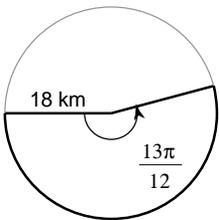
515)



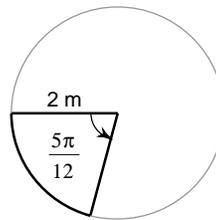
516)



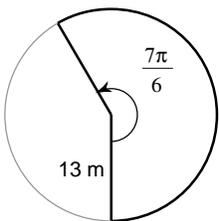
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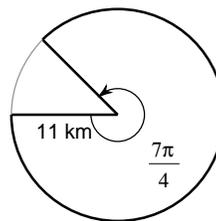
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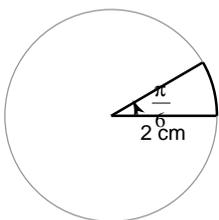
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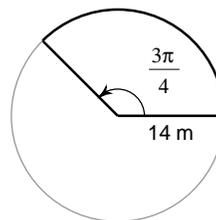
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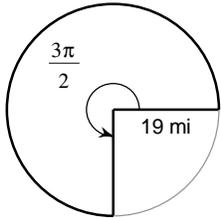
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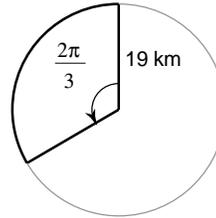
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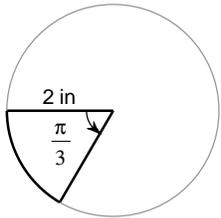
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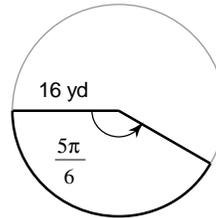
524)



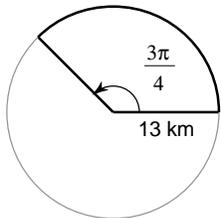
525)



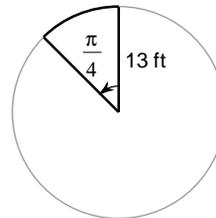
526)



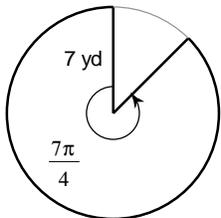
527)



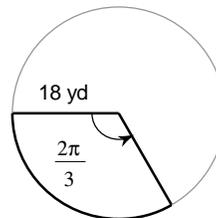
528)



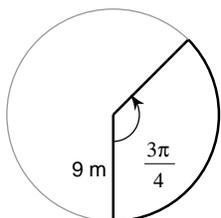
529)



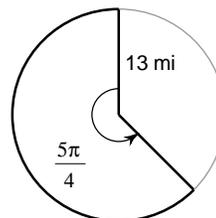
530)



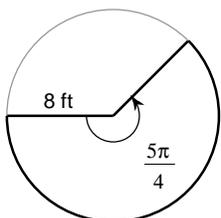
531)



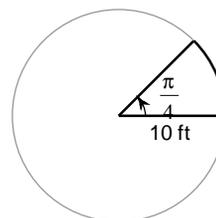
532)



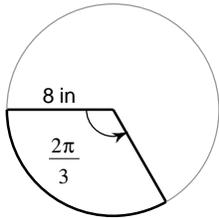
533)



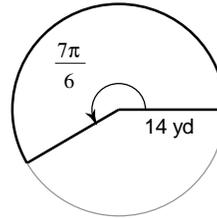
534)



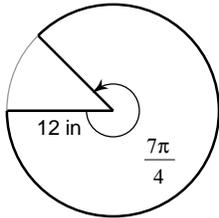
535)



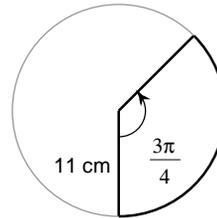
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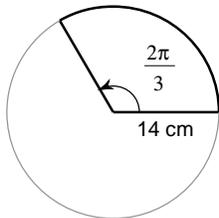
537)



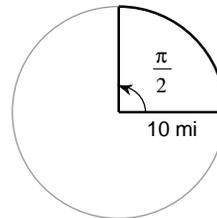
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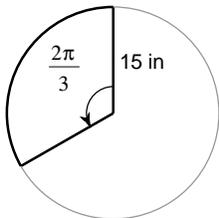
539)



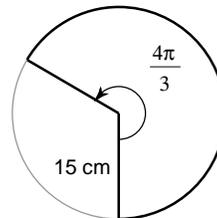
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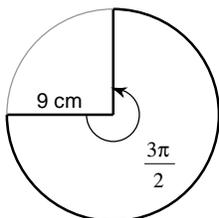
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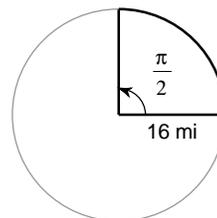
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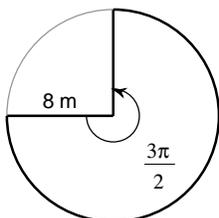
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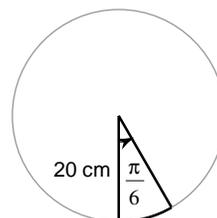
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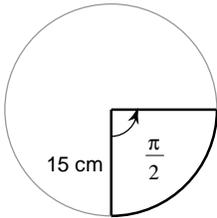
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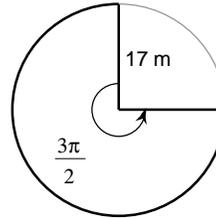
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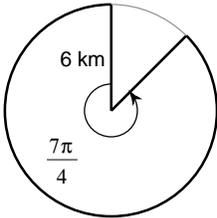
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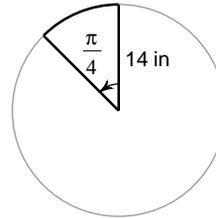
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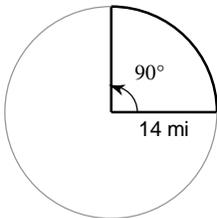
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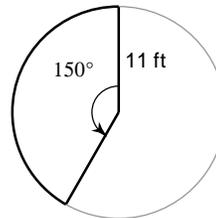
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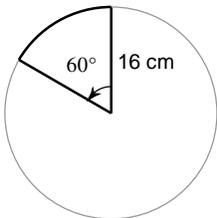
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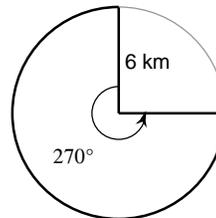
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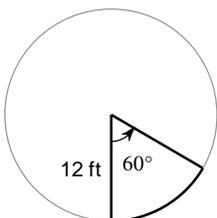
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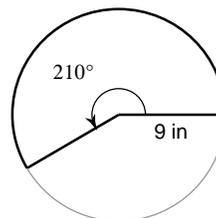
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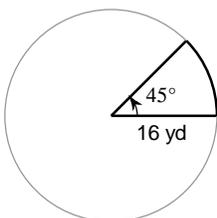
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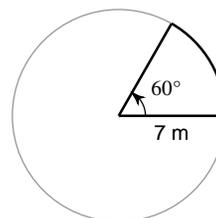
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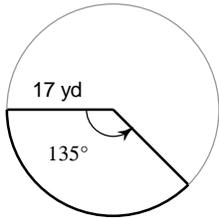
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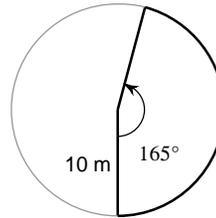
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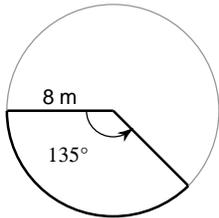
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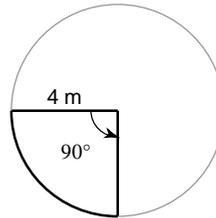
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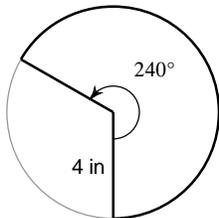
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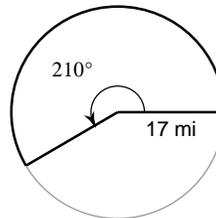
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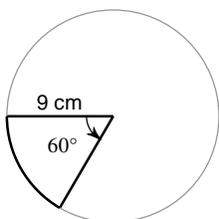
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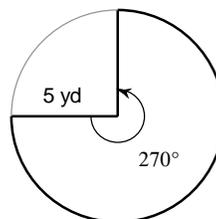
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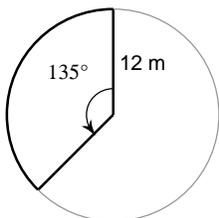
565)



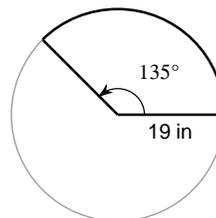
566)



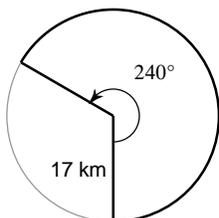
567)



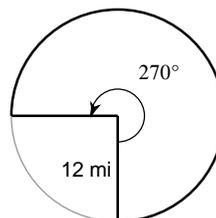
568)



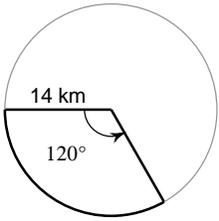
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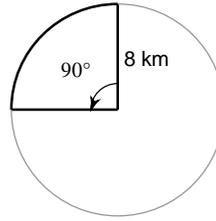
570)



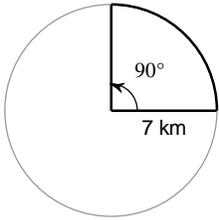
571)



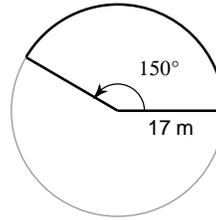
572)



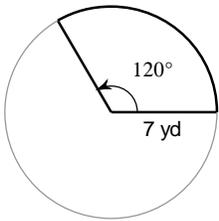
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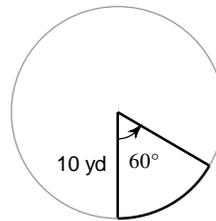
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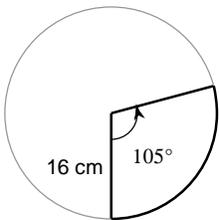
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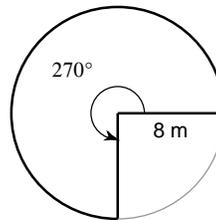
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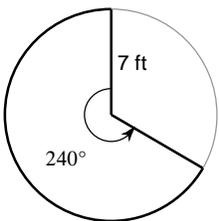
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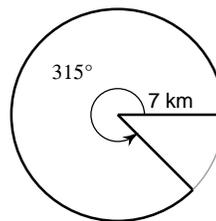
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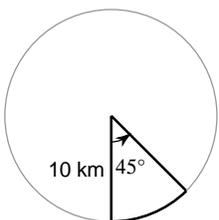
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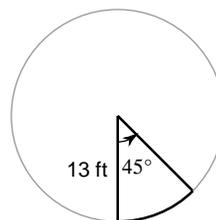
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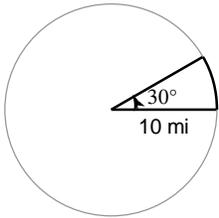
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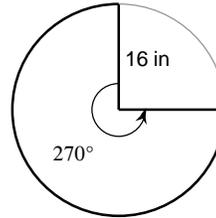
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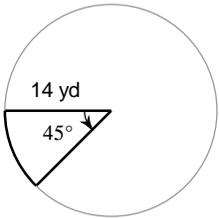
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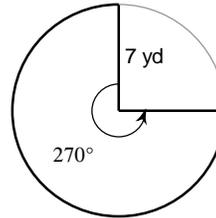
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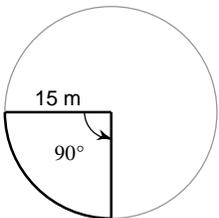
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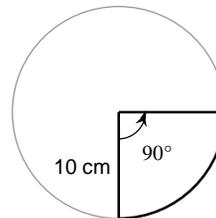
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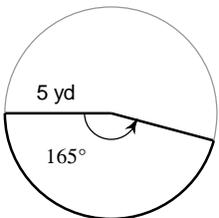
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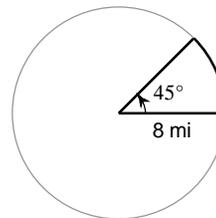
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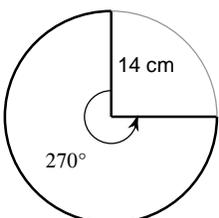
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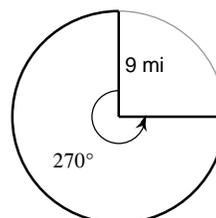
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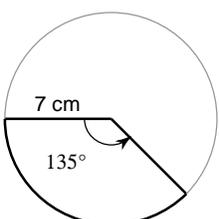
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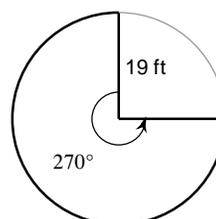
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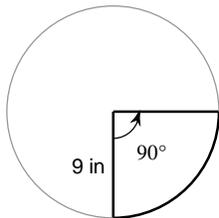
593)



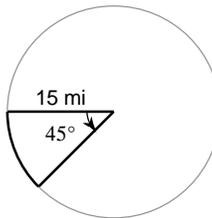
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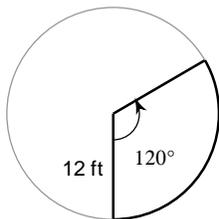
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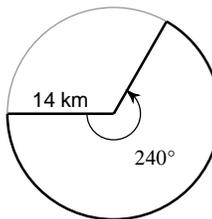
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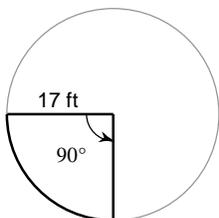
597)



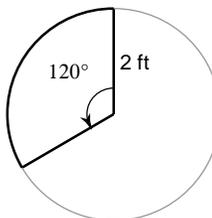
598)



599)

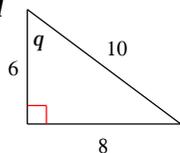


600)

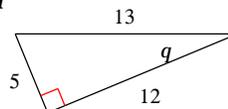


Find the value of the trig function indicated.

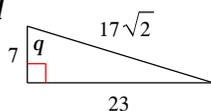
601) $\cos q$



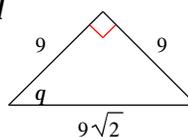
602) $\tan q$



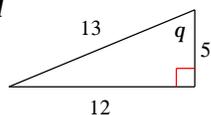
603) $\cos q$



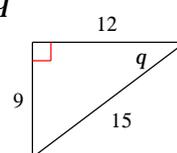
604) $\sin q$



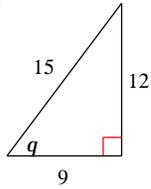
605) $\cos q$



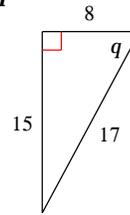
606) $\cos q$



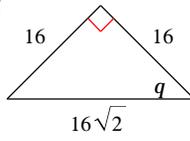
607) $\tan q$



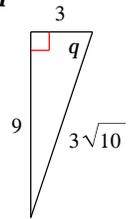
608) $\sin q$



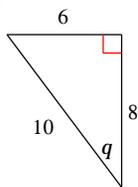
609) $\tan q$



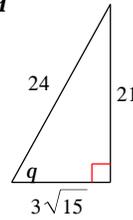
610) $\sin q$



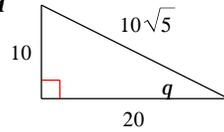
611) $\tan q$



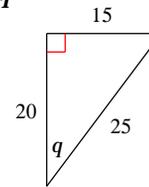
612) $\sin q$



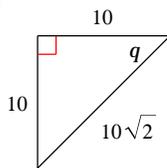
613) $\cos q$



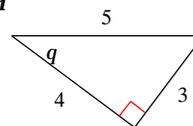
614) $\tan q$



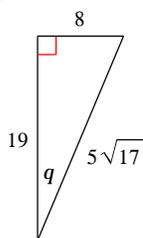
615) $\tan q$



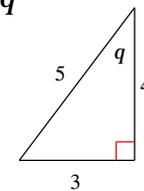
616) $\sin q$



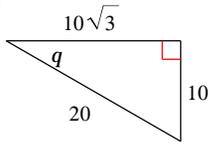
617) $\tan q$



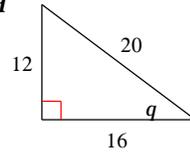
618) $\cos q$



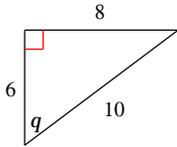
619) $\sin q$



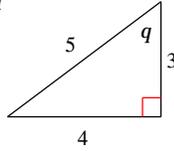
620) $\cos q$



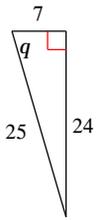
621) $\sin q$



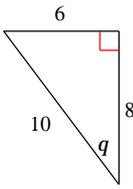
622) $\tan q$



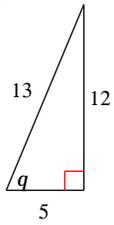
623) $\sin q$



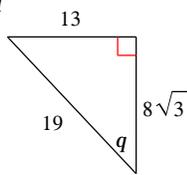
624) $\sin q$



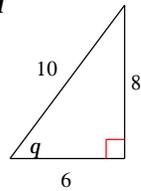
625) $\sin q$



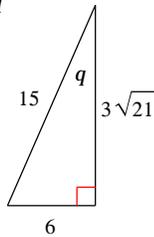
626) $\tan q$



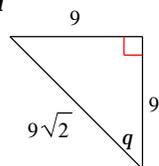
627) $\tan q$



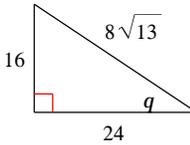
628) $\tan q$



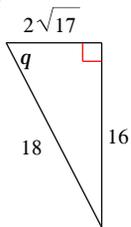
629) $\tan q$



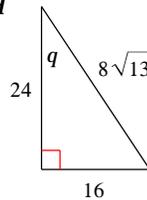
630) $\sin q$



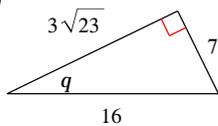
631) $\sin q$



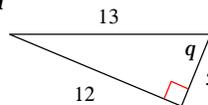
632) $\cos q$



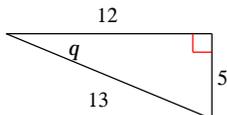
633) $\tan q$



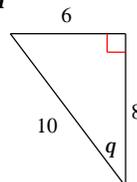
634) $\tan q$



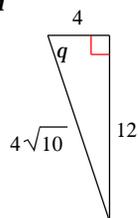
635) $\sin q$



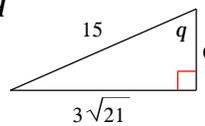
636) $\cos q$



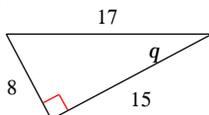
637) $\cos q$



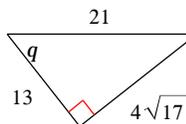
638) $\cos q$



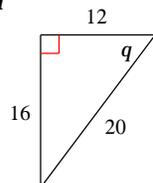
639) $\sin q$



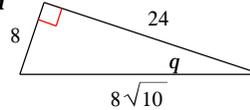
640) $\tan q$



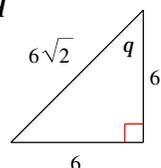
641) $\tan q$



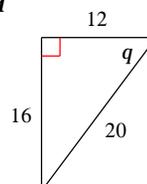
642) $\cos q$



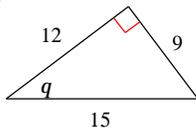
643) $\cos q$



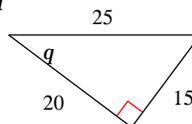
644) $\cos q$



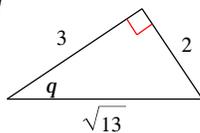
645) $\sin q$



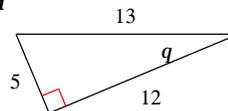
646) $\sin q$



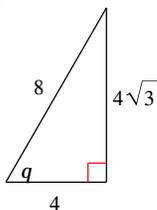
647) $\tan q$



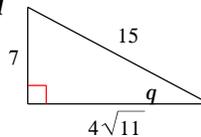
648) $\cos q$



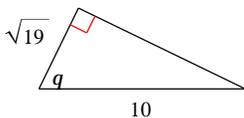
649) $\cos q$



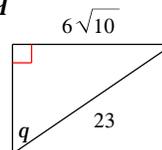
650) $\sin q$



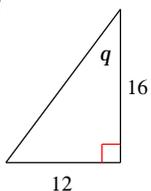
651) $\cot q$



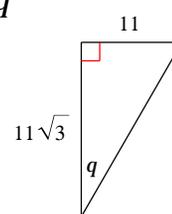
652) $\tan q$



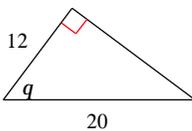
653) $\cos q$



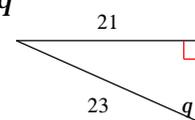
654) $\cot q$



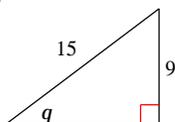
655) $\sec q$



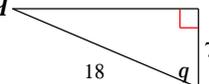
656) $\cos q$



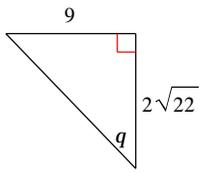
657) $\sin q$



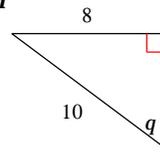
658) $\tan q$



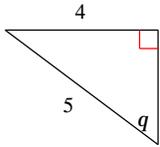
659) $\cos q$



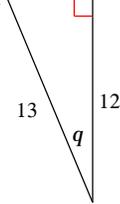
660) $\csc q$



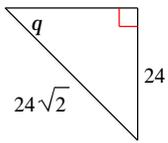
661) $\sin q$



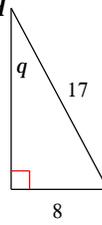
662) $\sin q$



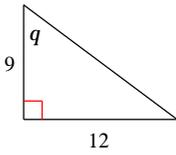
663) $\sin q$



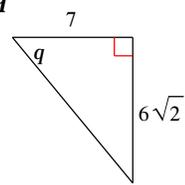
664) $\tan q$



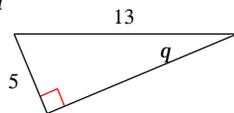
665) $\sin q$



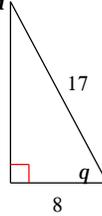
666) $\sec q$



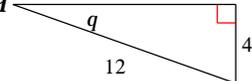
667) $\tan q$



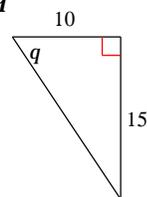
668) $\tan q$

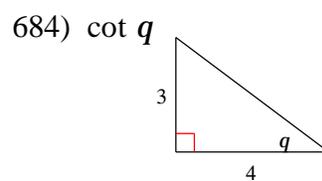
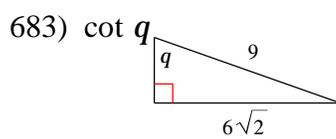
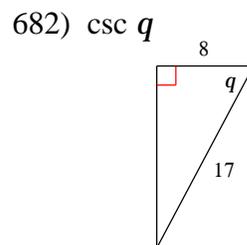
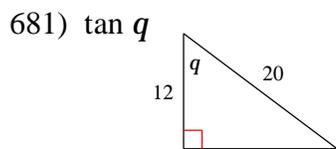
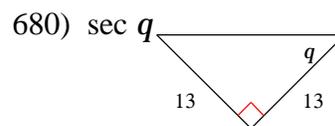
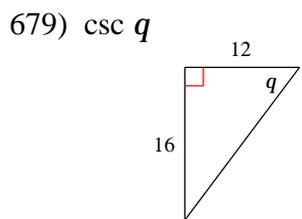
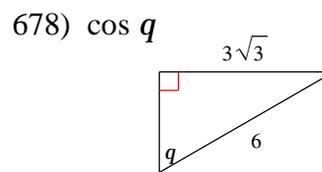
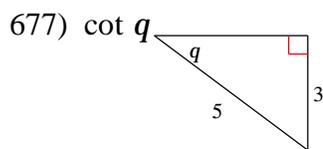
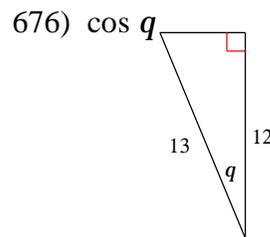
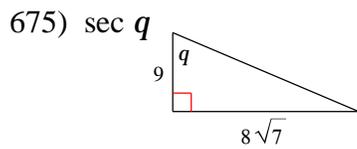
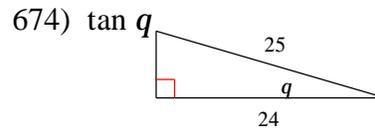
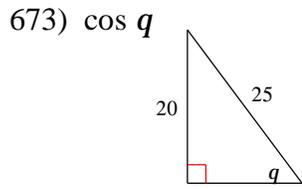
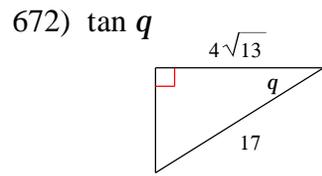
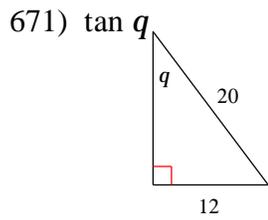


669) $\cos q$

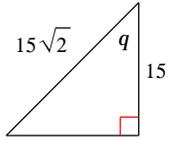


670) $\csc q$

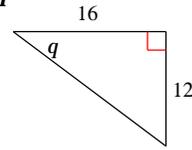




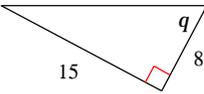
685) $\csc q$



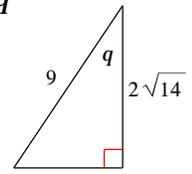
686) $\tan q$



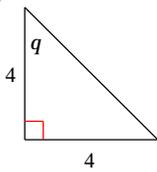
687) $\sin q$



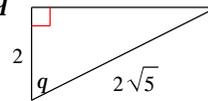
688) $\sec q$



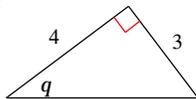
689) $\sec q$



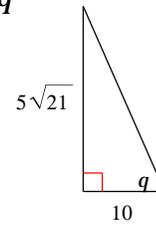
690) $\tan q$



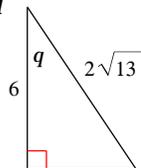
691) $\csc q$



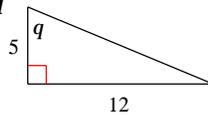
692) $\cos q$



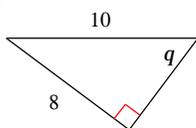
693) $\cos q$



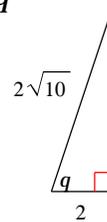
694) $\sin q$



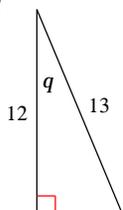
695) $\sec q$



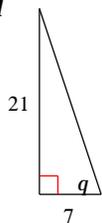
696) $\cot q$



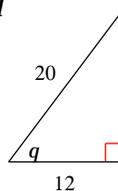
697) $\cot q$



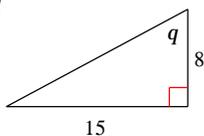
698) $\cos q$



699) $\sin q$



700) $\csc q$



701) Find $\sin q$ if $\sec q = \frac{25}{24}$

702) Find $\cos q$ if $\csc q = \frac{5}{3}$

703) Find $\csc q$ if $\cot q = \frac{12}{5}$

704) Find $\sin q$ if $\csc q = \frac{5}{4}$

705) Find $\tan q$ if $\cos q = \frac{12}{13}$

706) Find $\tan q$ if $\csc q = \frac{\sqrt{13}}{3}$

707) Find $\sin q$ if $\csc q = \frac{\sqrt{10}}{3}$

708) Find $\sin q$ if $\cot q = \frac{3}{4}$

709) Find $\cos q$ if $\csc q = \frac{7}{5}$

710) Find $\sec q$ if $\cos q = \frac{15}{17}$

711) Find $\sin q$ if $\sec q = \frac{5}{4}$

712) Find $\csc q$ if $\sin q = \frac{3\sqrt{13}}{13}$

713) Find $\cot q$ if $\cos q = \frac{24}{25}$

714) Find $\sec q$ if $\sin q = \frac{4}{5}$

715) Find $\cos q$ if $\sin q = \frac{15}{17}$

716) Find $\cot q$ if $\sec q = \frac{5\sqrt{5}}{11}$

717) Find $\csc q$ if $\sin q = \frac{4}{5}$

718) Find $\csc q$ if $\sin q = \frac{3}{5}$

719) Find $\cot q$ if $\sin q = \frac{4}{5}$

720) Find $\tan q$ if $\cot q = \frac{3}{4}$

721) Find $\tan q$ if $\cos q = \frac{4}{5}$

722) Find $\cot q$ if $\sin q = \frac{3\sqrt{13}}{11}$

723) Find $\sec q$ if $\cos q = \frac{\sqrt{2}}{2}$

724) Find $\csc q$ if $\tan q = \frac{\sqrt{3}}{12}$

725) Find $\sin q$ if $\cot q = 1$

726) Find $\sec q$ if $\cos q = \frac{12}{13}$

727) Find $\csc q$ if $\sec q = 2$

728) Find $\tan q$ if $\csc q = \sqrt{5}$

729) Find $\sec q$ if $\cos q = \frac{2\sqrt{5}}{5}$

730) Find $\sin q$ if $\tan q = \frac{2}{3}$

731) Find $\tan q$ if $\csc q = \frac{25}{24}$

732) Find $\cot q$ if $\tan q = \frac{\sqrt{15}}{15}$

733) Find $\tan q$ if $\cos q = \frac{6\sqrt{13}}{65}$

734) Find $\csc q$ if $\cos q = \frac{5}{7}$

735) Find $\sin q$ if $\csc q = \frac{\sqrt{13}}{2}$

736) Find $\sin q$ if $\tan q = \frac{8}{15}$

737) Find $\tan q$ if $\cot q = \frac{12}{5}$

738) Find $\tan q$ if $\sin q = \frac{3\sqrt{10}}{10}$

739) Find $\cos q$ if $\sec q = \frac{19}{13}$

740) Find $\sec q$ if $\cos q = \frac{3}{5}$

741) Find $\sec q$ if $\tan q = \frac{5}{12}$

742) Find $\csc q$ if $\cos q = \frac{3}{5}$

743) Find $\sin q$ if $\csc q = \frac{14}{13}$

744) Find $\tan q$ if $\sec q = \frac{17}{15}$

745) Find $\sec q$ if $\tan q = \frac{3}{4}$

746) Find $\csc q$ if $\sec q = \frac{5}{4}$

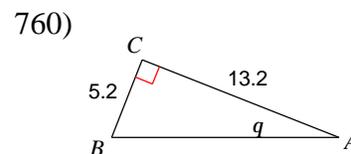
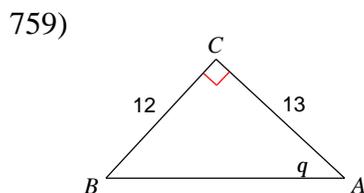
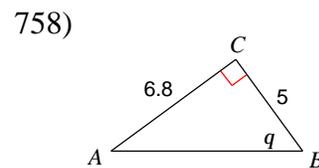
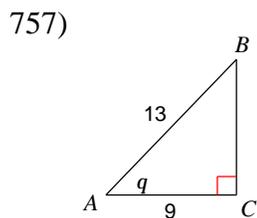
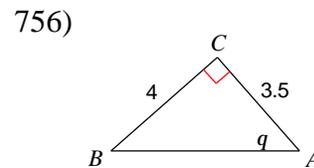
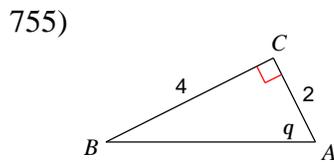
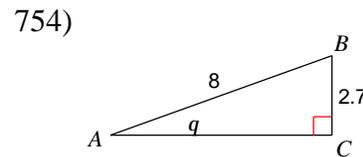
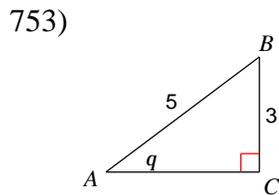
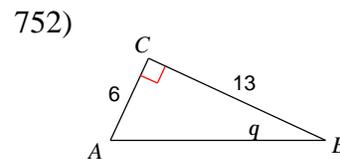
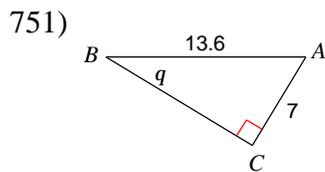
747) Find $\cos q$ if $\tan q = \frac{7\sqrt{2}}{12}$

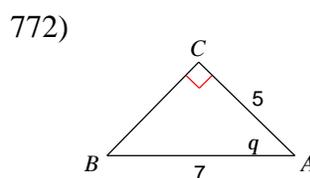
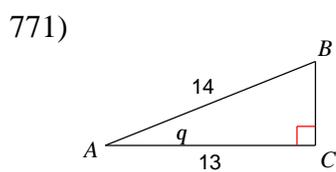
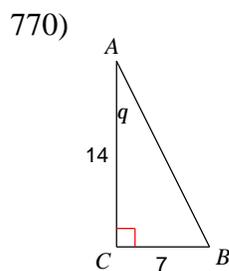
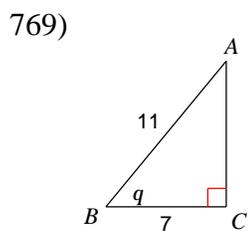
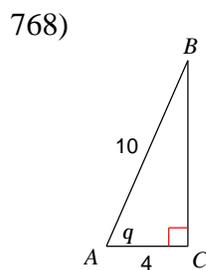
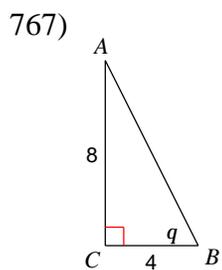
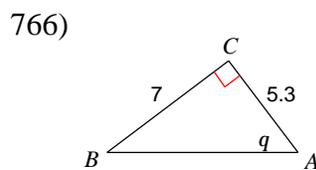
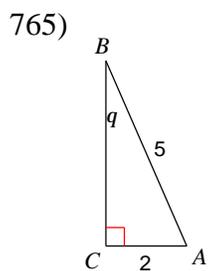
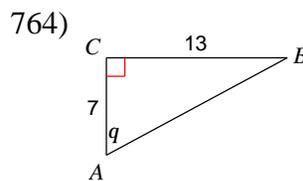
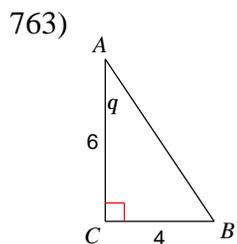
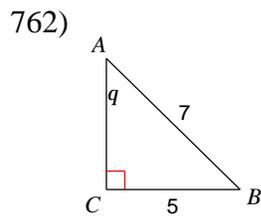
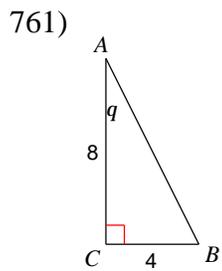
748) Find $\csc q$ if $\tan q = \frac{3}{4}$

749) Find $\csc q$ if $\cos q = \frac{4}{5}$

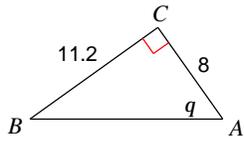
750) Find $\sin q$ if $\sec q = \frac{14\sqrt{3}}{9}$

Find the measure of each angle indicated. Round to the nearest tenth.

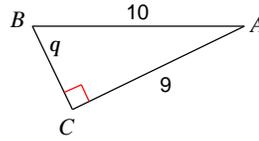




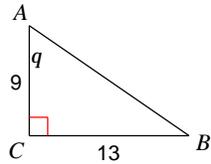
773)



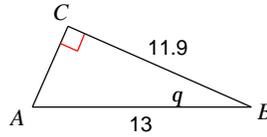
774)



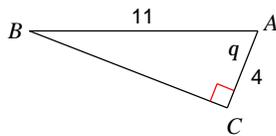
775)



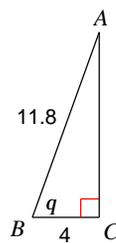
776)



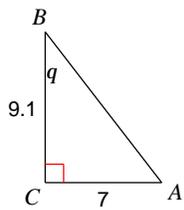
777)



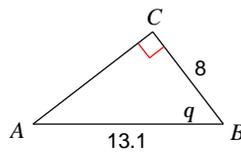
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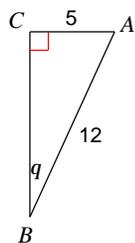
779)



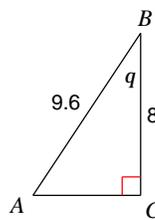
780)



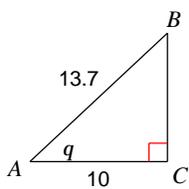
781)



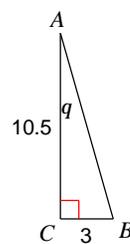
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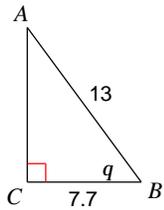
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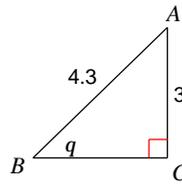
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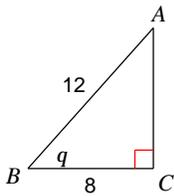
785)



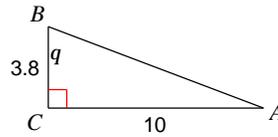
786)



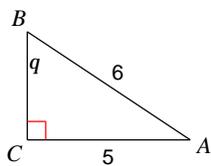
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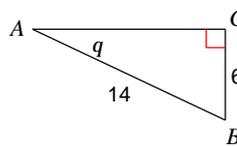
788)



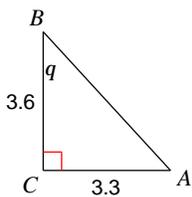
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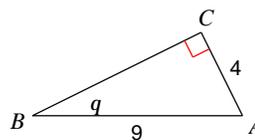
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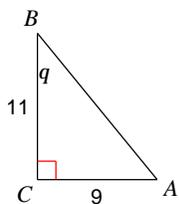
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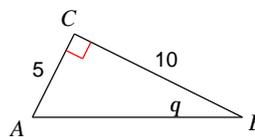
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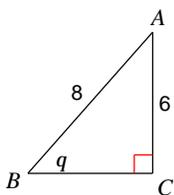
793)



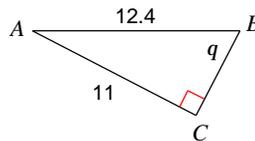
794)



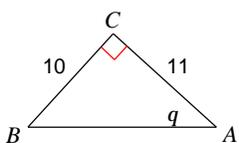
795)



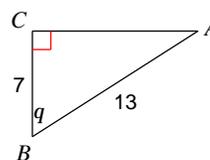
796)



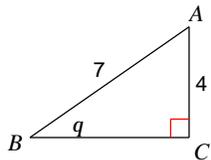
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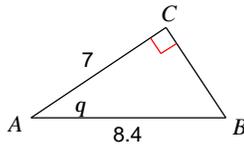
798)



799)

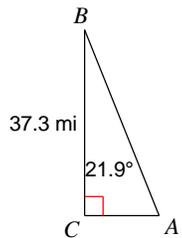


800)

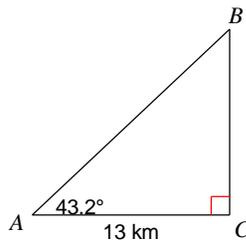


Solve each triangle. Round answers to the nearest tenth.

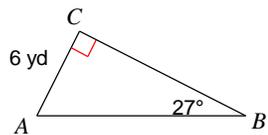
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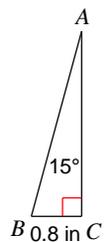
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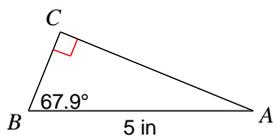
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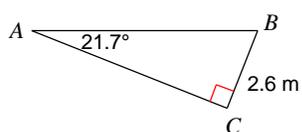
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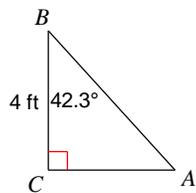
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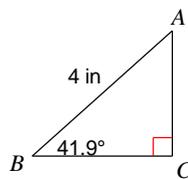
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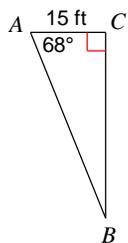
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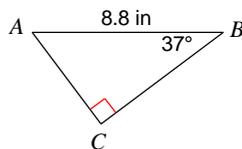
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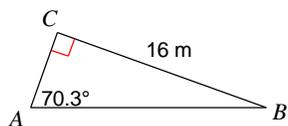
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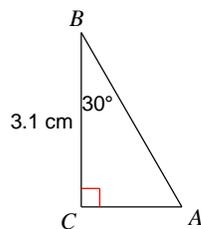
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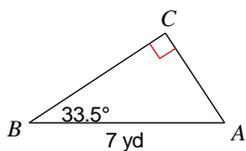
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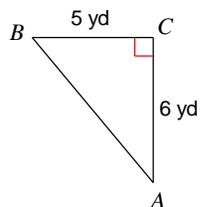
812)



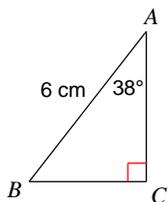
813)



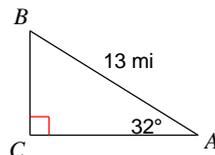
814)



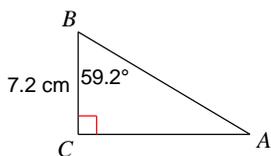
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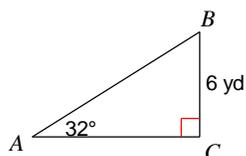
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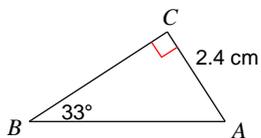
817)



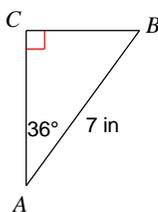
818)



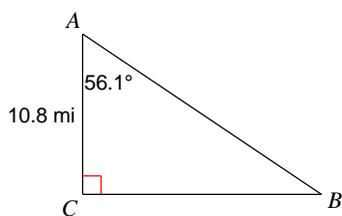
819)



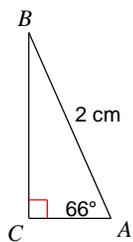
820)



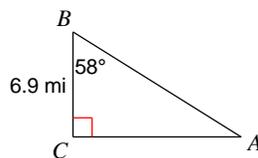
821)



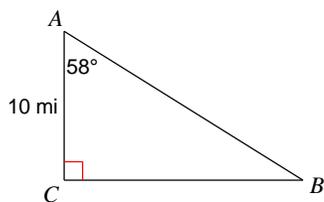
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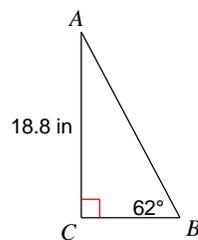
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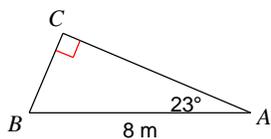
824)



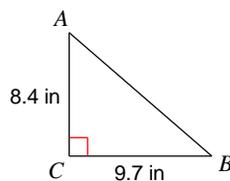
825)



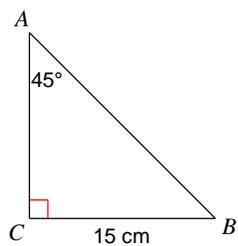
826)



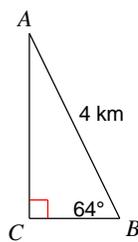
827)



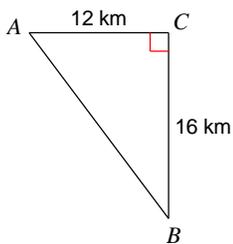
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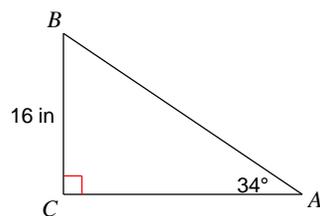
829)



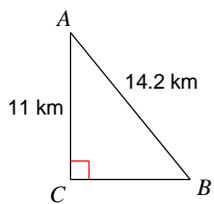
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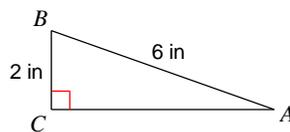
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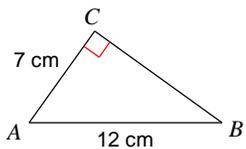
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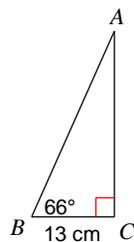
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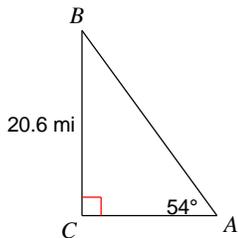
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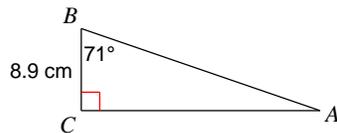
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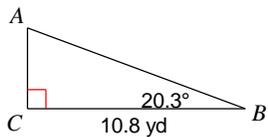
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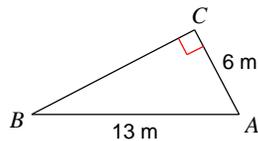
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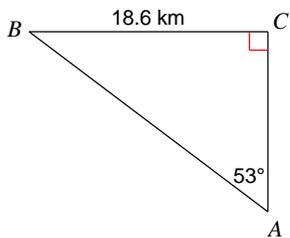
838)



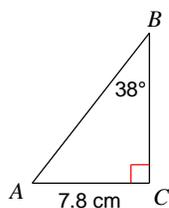
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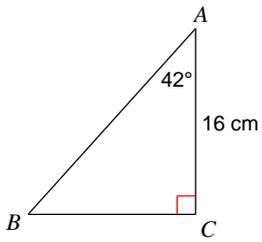
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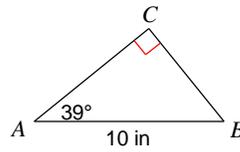
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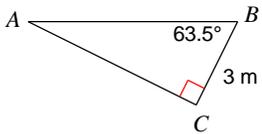
842)



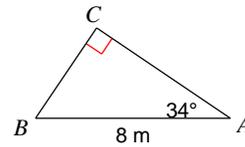
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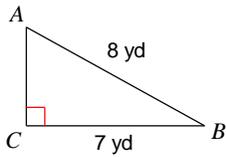
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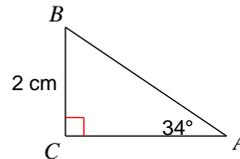
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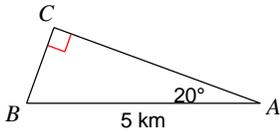
846)



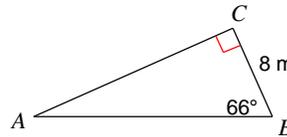
847)



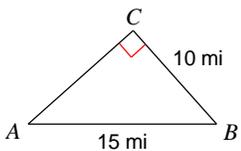
848)



849)



850)



In each problem, angle C is a right angle. Solve each triangle rounding answers to the nearest tenth.

851) $c = 4$ ft, $m\angle A = 44.5^\circ$

852) $a = 14$ yd, $b = 11$ yd

853) $a = 10$ yd, $m\angle A = 24^\circ$

854) $c = 13$ m, $m\angle B = 28^\circ$

855) $m\angle B = 61^\circ$, $c = 3$ ft

856) $m\angle A = 32^\circ$, $a = 7$ ft

857) $a = 10.8$ cm, $m\angle A = 35^\circ$

858) $m\angle B = 48^\circ$, $b = 2$ in

859) $a = 13$ in, $m\angle B = 51^\circ$

860) $m\angle A = 41^\circ$, $b = 5$ mi

861) $m\angle B = 39^\circ$, $b = 7.3$ mi

862) $b = 10$ mi, $a = 3.7$ mi

863) $b = 3.8$ cm, $m\angle A = 53^\circ$

864) $a = 9.6$ yd, $m\angle B = 57^\circ$

865) $b = 14$ yd, $a = 5.2$ yd

866) $b = 9$ mi, $m\angle A = 47^\circ$

867) $m\angle B = 31^\circ$, $a = 20$ yd

868) $c = 9$ m, $b = 8$ m

869) $a = 5.8$ cm, $m\angle B = 25^\circ$

870) $m\angle B = 32^\circ$, $a = 14.4$ yd

871) $c = 5$ in, $a = 4$ in

872) $m\angle B = 48^\circ$, $c = 4.3$ cm

873) $m\angle B = 44^\circ$, $c = 16$ yd

874) $m\angle B = 53^\circ$, $c = 3$ mi

875) $a = 8$ mi, $c = 11$ mi

876) $c = 7$ m, $m\angle A = 19^\circ$

877) $a = 6.6$ mi, $m\angle B = 37^\circ$

878) $a = 11$ cm, $b = 6$ cm

879) $m\angle A = 70^\circ$, $c = 7.3$ km

880) $c = 4$ mi, $m\angle B = 44^\circ$

881) $c = 9$ m, $m\angle B = 64^\circ$

882) $m\angle B = 66^\circ$, $a = 1.8$ cm

883) $a = 2$ cm, $c = 4.8$ cm

884) $a = 13$ mi, $b = 7$ mi

885) $b = 14$ km, $m\angle B = 24^\circ$

886) $b = 6$ in, $m\angle B = 26^\circ$

887) $m\angle B = 47^\circ$, $c = 8.9$ mi

888) $m\angle A = 44^\circ$, $a = 11.6$ m

889) $b = 7.6$ mi, $m\angle A = 64.7^\circ$

890) $c = 15$ mi, $m\angle B = 68^\circ$

891) $b = 12.6$ ft, $a = 12$ ft

892) $m\angle B = 39^\circ$, $c = 16$ mi

893) $m\angle B = 49^\circ$, $c = 7.7$ m

894) $a = 11$ in, $b = 11.3$ in

895) $c = 15$ cm, $m\angle B = 33^\circ$

896) $a = 16.9$ in, $m\angle B = 33^\circ$

897) $b = 14.4$ ft, $m\angle B = 64^\circ$

898) $m\angle B = 17.2^\circ$, $a = 35.5$ yd

899) $c = 3$ cm, $m\angle A = 31^\circ$

900) $c = 9$ km, $a = 6$ km

State the quadrant in which the terminal side of each angle lies.

1) 225°

III

2) 204°

III

3) -155°

III

4) 255°

III

5) 20°

I

6) 280°

IV

7) -241°

II

8) 330°

IV

9) 80°

I

10) 105°

II

11) 104°

II

12) 155°

II

13) 357°

IV

14) -123°

III

15) 135°

II

16) -335°

I

17) -35°

IV

18) 100°

II

19) -125°

III

20) 150°

II

21) 240°

III

22) -195°

II

23) -254°

II

24) 29°

I

25) -210°

II

26) 40°

I

27) -294°

I

28) 50°

I

29) -145°

III

30) 339°

IV

31) -60°

IV

32) -130°

III

33) 210°

III

35) -40°

IV

37) 190°

III

39) -273°

I

41) 220°

III

43) -245°

II

45) -280°

I

47) 235°

III

49) 10°

I

34) 26°

I

36) -121°

III

38) 325°

IV

40) -230°

II

42) -126°

III

44) 115°

II

46) -283°

I

48) 261°

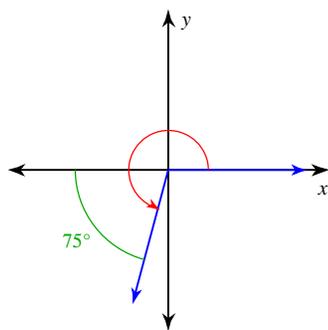
III

50) -120°

III

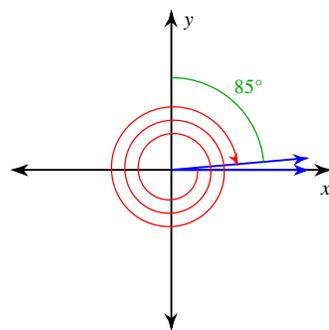
Find the measure of each angle.

51)



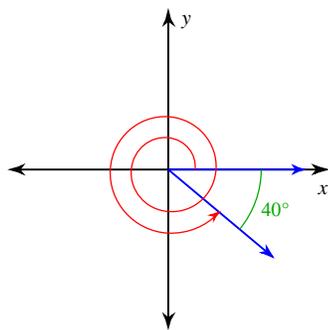
255°

52)



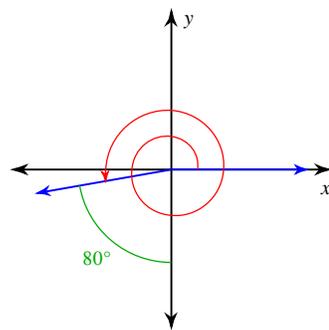
-1075°

53)



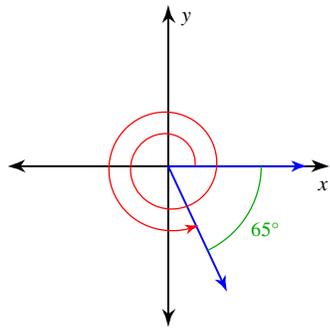
680°

54)



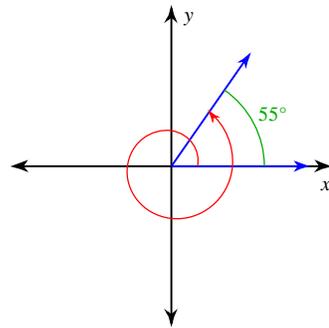
550°

55)



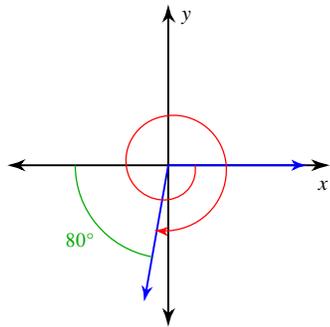
655°

56)



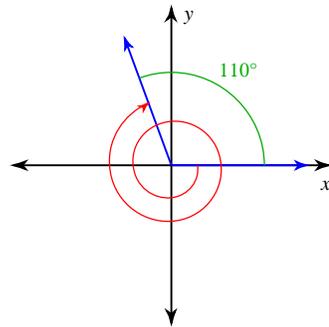
415°

57)



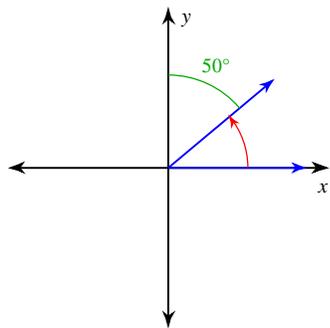
-460°

58)



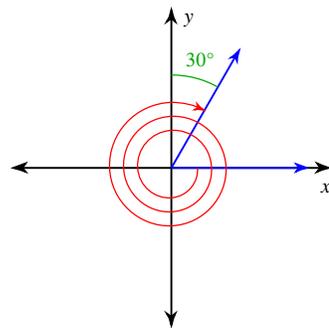
-610°

59)



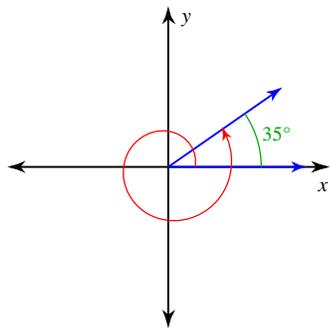
40°

60)



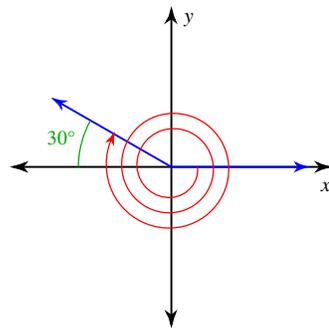
-1020°

61)



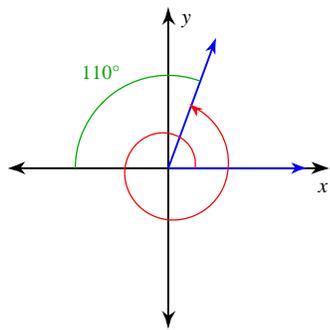
395°

62)



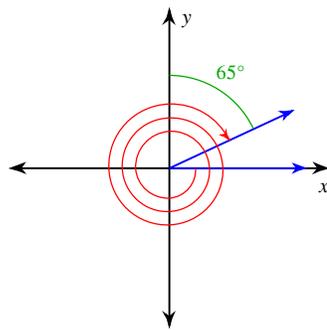
-930°

63)



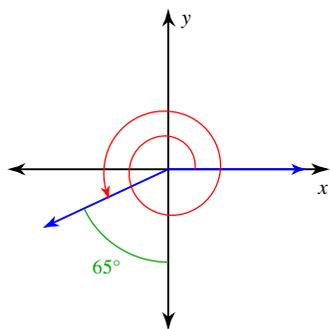
430°

64)



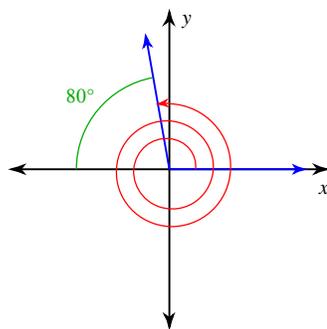
-1055°

65)



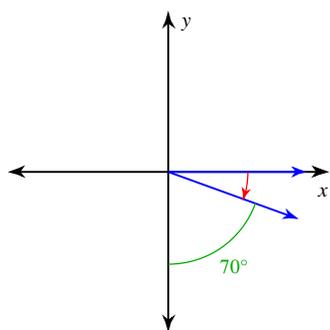
565°

66)



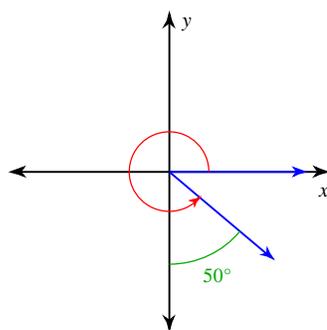
820°

67)



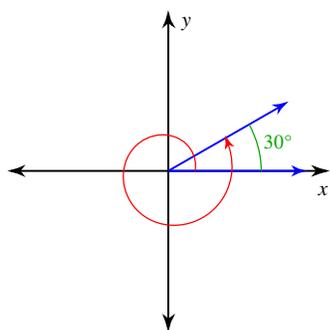
-20°

68)



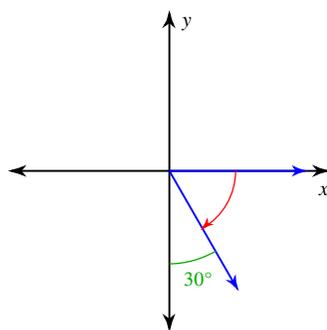
320°

69)



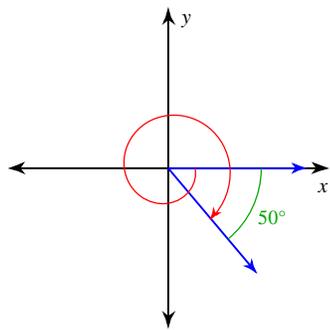
390°

70)



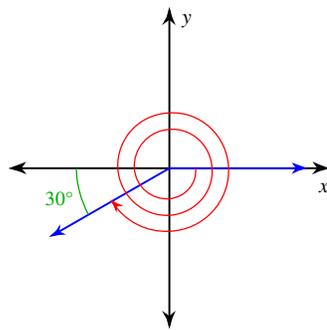
-60°

71)



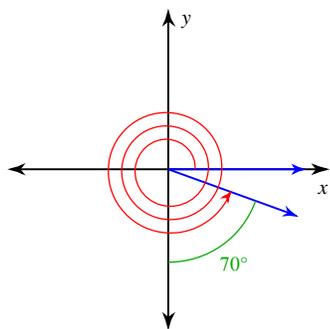
-410°

72)



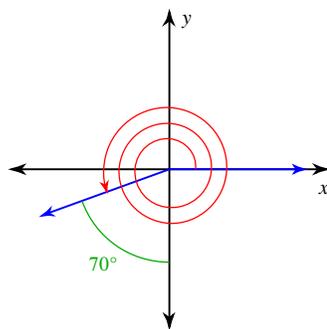
-870°

73)



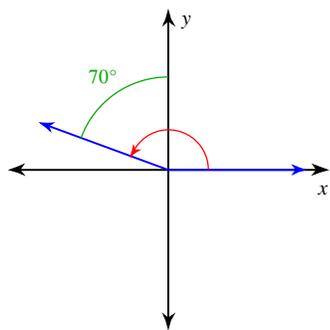
1060°

74)



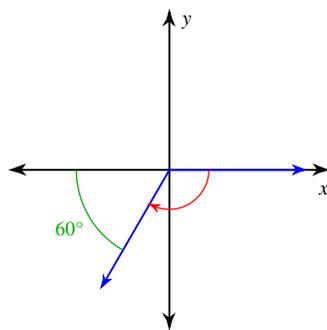
920°

75)



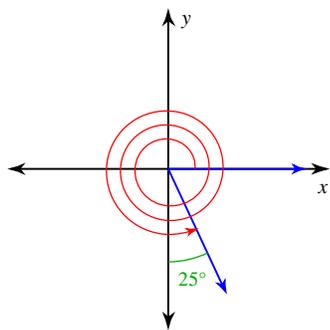
160°

76)



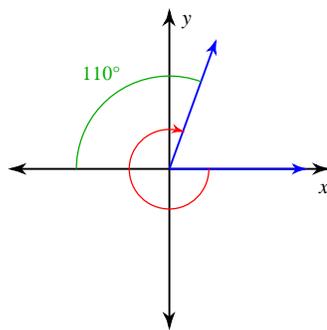
-120°

77)



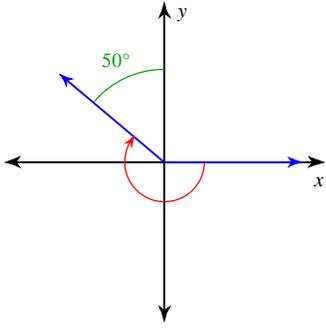
1015°

78)



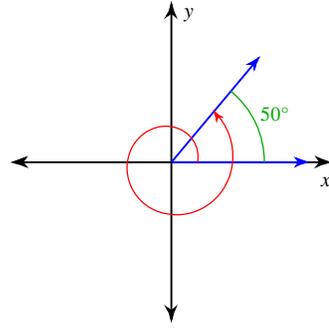
-290°

79)



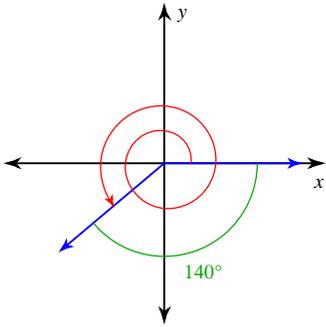
-220°

80)



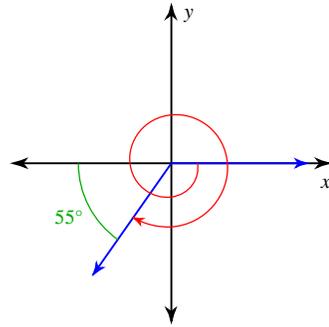
410°

81)



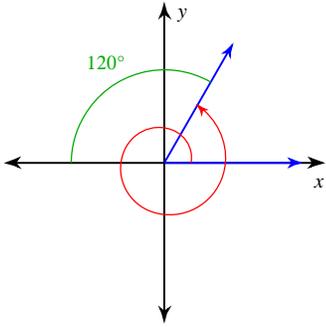
580°

82)



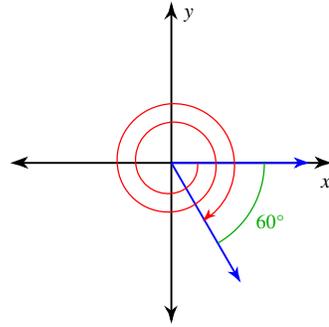
-485°

83)



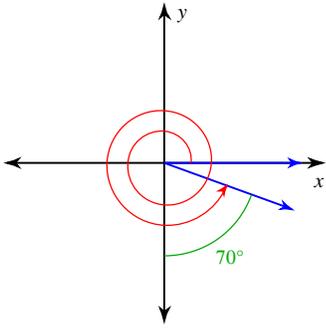
420°

84)



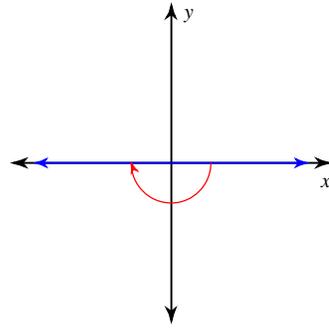
-780°

85)



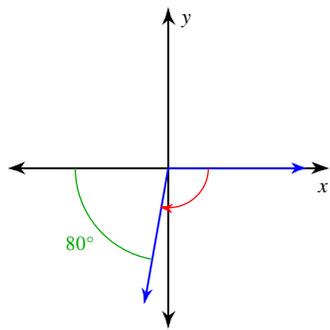
700°

86)



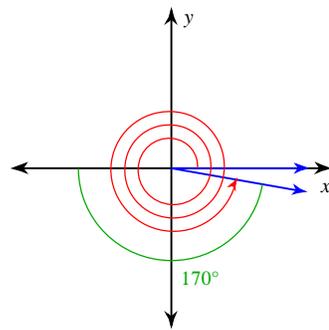
-180°

87)



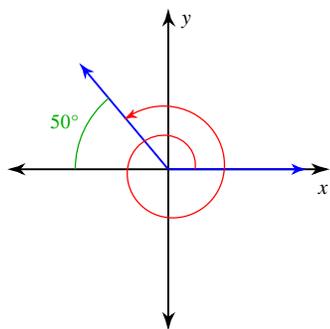
-100°

88)



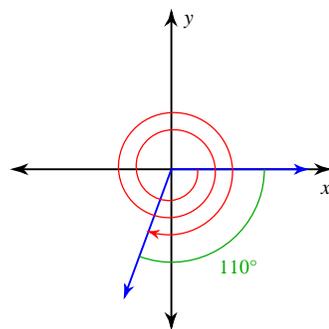
1070°

89)



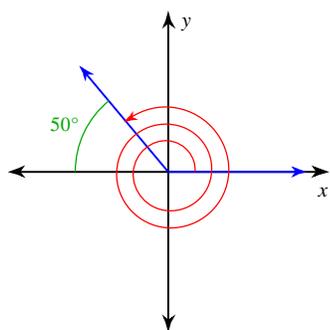
490°

90)



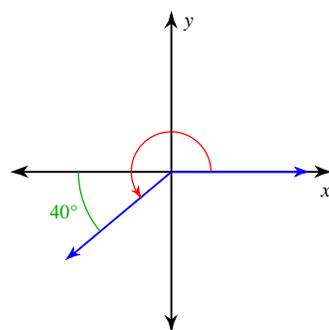
-830°

91)



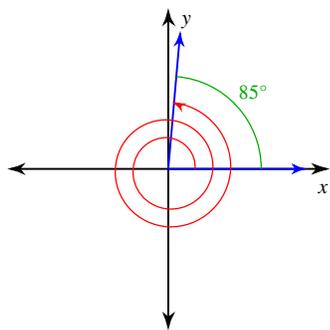
850°

92)



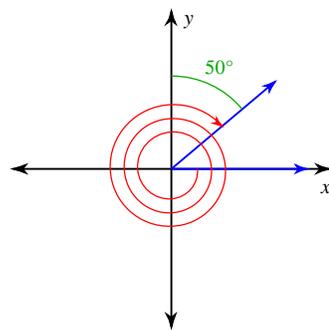
220°

93)



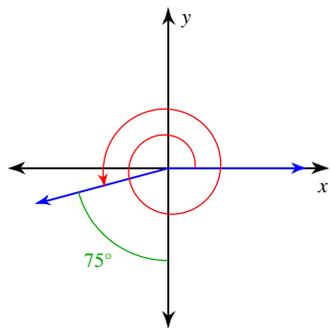
805°

94)

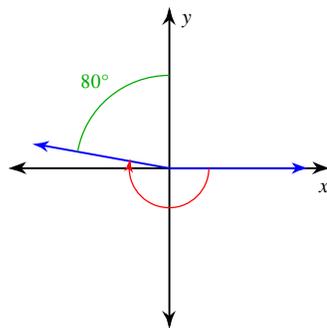


-1040°

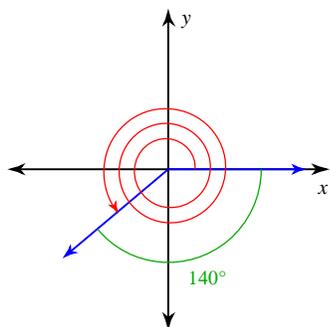
95)

 555°

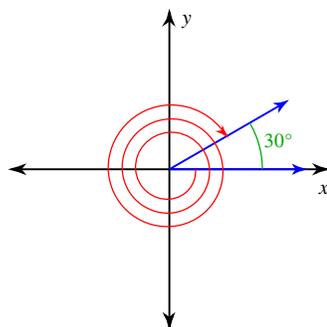
96)

 -190°

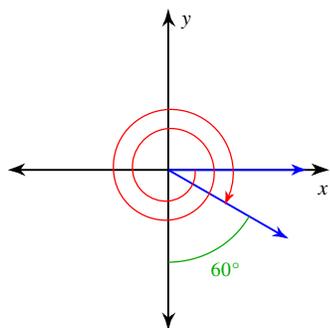
97)

 940°

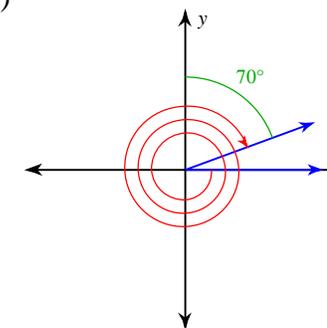
98)

 -1050°

99)

 -750°

100)

 -1060° **Find the reference angle.**

101) $-\frac{10\pi}{3}$ $\frac{\pi}{3}$

102) $-\frac{47\pi}{18}$ $\frac{7\pi}{18}$

103) $\frac{5\pi}{6}$ $\frac{\pi}{6}$

104) $-\frac{19\pi}{18}$ $\frac{\pi}{18}$

105) $\frac{17\pi}{6}$ $\frac{\pi}{6}$

106) $\frac{55\pi}{18}$ $\frac{\pi}{18}$

107) $\frac{34\pi}{9}$ $\frac{2\pi}{9}$

108) $-\frac{23\pi}{9}$ $\frac{4\pi}{9}$

$$109) -\frac{11\pi}{9} \frac{2\pi}{9}$$

$$110) \frac{17\pi}{9} \frac{\pi}{9}$$

$$111) -\frac{17\pi}{6} \frac{\pi}{6}$$

$$112) -\frac{7\pi}{3} \frac{\pi}{3}$$

$$113) \frac{19\pi}{18} \frac{\pi}{18}$$

$$114) -\frac{26\pi}{9} \frac{\pi}{9}$$

$$115) -\frac{19\pi}{6} \frac{\pi}{6}$$

$$116) \frac{7\pi}{3} \frac{\pi}{3}$$

$$117) -\frac{13\pi}{6} \frac{\pi}{6}$$

$$118) \frac{29\pi}{18} \frac{7\pi}{18}$$

$$119) -\frac{25\pi}{12} \frac{\pi}{12}$$

$$120) -\frac{7\pi}{9} \frac{2\pi}{9}$$

$$121) \frac{9\pi}{4} \frac{\pi}{4}$$

$$122) \frac{11\pi}{18} \frac{7\pi}{18}$$

$$123) \frac{8\pi}{9} \frac{\pi}{9}$$

$$124) -\frac{15\pi}{4} \frac{\pi}{4}$$

$$125) -\frac{31\pi}{18} \frac{5\pi}{18}$$

$$126) -\frac{3\pi}{4} \frac{\pi}{4}$$

$$127) -\frac{71\pi}{18} \frac{\pi}{18}$$

$$128) -\frac{5\pi}{3} \frac{\pi}{3}$$

$$129) -\frac{7\pi}{6} \frac{\pi}{6}$$

$$130) \frac{13\pi}{4} \frac{\pi}{4}$$

$$131) -\frac{14\pi}{9} \frac{4\pi}{9}$$

$$132) -\frac{13\pi}{9} \frac{4\pi}{9}$$

133) $-\frac{11\pi}{12} \frac{\pi}{12}$

134) $\frac{19\pi}{6} \frac{\pi}{6}$

135) $\frac{28\pi}{9} \frac{\pi}{9}$

136) $-\frac{25\pi}{9} \frac{2\pi}{9}$

137) $-\frac{23\pi}{6} \frac{\pi}{6}$

138) $-\frac{11\pi}{6} \frac{\pi}{6}$

139) $\frac{11\pi}{12} \frac{\pi}{12}$

140) $-\frac{32\pi}{9} \frac{4\pi}{9}$

141) $-\frac{5\pi}{9} \frac{4\pi}{9}$

142) $\frac{8\pi}{3} \frac{\pi}{3}$

143) $-\frac{5\pi}{4} \frac{\pi}{4}$

144) $\frac{11\pi}{6} \frac{\pi}{6}$

145) $\frac{35\pi}{9} \frac{\pi}{9}$

146) $-\frac{5\pi}{6} \frac{\pi}{6}$

147) $-\frac{35\pi}{9} \frac{\pi}{9}$

148) $\frac{29\pi}{12} \frac{5\pi}{12}$

149) $\frac{43\pi}{18} \frac{7\pi}{18}$

150) $\frac{11\pi}{3} \frac{\pi}{3}$

Convert each degree measure into radians.

151) $260^\circ \frac{13\pi}{9}$

152) $150^\circ \frac{5\pi}{6}$

153) $200^\circ \frac{10\pi}{9}$

154) $30^\circ \frac{\pi}{6}$

155) $285^\circ \frac{19\pi}{12}$

156) $165^\circ \frac{11\pi}{12}$

157) $240^\circ \frac{4\pi}{3}$

158) $50^\circ \frac{5\pi}{18}$

159) $65^\circ \frac{13\pi}{36}$

160) $220^\circ \frac{11\pi}{9}$

- 161) $90^\circ \frac{\pi}{2}$
- 162) $125^\circ \frac{25\pi}{36}$
- 163) $115^\circ \frac{23\pi}{36}$
- 164) $15^\circ \frac{\pi}{12}$
- 165) $55^\circ \frac{11\pi}{36}$
- 166) $140^\circ \frac{7\pi}{9}$
- 167) $340^\circ \frac{17\pi}{9}$
- 168) $5^\circ \frac{\pi}{36}$
- 169) $60^\circ \frac{\pi}{3}$
- 170) $345^\circ \frac{23\pi}{12}$
- 171) $245^\circ \frac{49\pi}{36}$
- 172) $135^\circ \frac{3\pi}{4}$
- 173) $270^\circ \frac{3\pi}{2}$
- 174) $105^\circ \frac{7\pi}{12}$
- 175) $335^\circ \frac{67\pi}{36}$
- 176) $265^\circ \frac{53\pi}{36}$
- 177) $300^\circ \frac{5\pi}{3}$
- 178) $130^\circ \frac{13\pi}{18}$
- 179) $320^\circ \frac{16\pi}{9}$
- 180) $75^\circ \frac{5\pi}{12}$
- 181) $315^\circ \frac{7\pi}{4}$
- 182) $85^\circ \frac{17\pi}{36}$
- 183) $350^\circ \frac{35\pi}{18}$
- 184) $145^\circ \frac{29\pi}{36}$
- 185) $120^\circ \frac{2\pi}{3}$
- 186) $170^\circ \frac{17\pi}{18}$
- 187) $195^\circ \frac{13\pi}{12}$
- 188) $230^\circ \frac{23\pi}{18}$
- 189) $80^\circ \frac{4\pi}{9}$
- 190) $45^\circ \frac{\pi}{4}$
- 191) $190^\circ \frac{19\pi}{18}$
- 192) $280^\circ \frac{14\pi}{9}$
- 193) $225^\circ \frac{5\pi}{4}$
- 194) $215^\circ \frac{43\pi}{36}$
- 195) $40^\circ \frac{2\pi}{9}$
- 196) $290^\circ \frac{29\pi}{18}$
- 197) $330^\circ \frac{11\pi}{6}$
- 198) $210^\circ \frac{7\pi}{6}$

199) $255^\circ \frac{17\pi}{12}$

200) $310^\circ \frac{31\pi}{18}$

Convert each degree measure into radians and each radian measure into degrees.

201) $-50^\circ -\frac{5\pi}{18}$

202) $\frac{5\pi}{3}$

300°

203) $\frac{5\pi}{4}$

204) $120^\circ \frac{2\pi}{3}$

205) $70^\circ \frac{7\pi}{18}$

206) $105^\circ \frac{7\pi}{12}$

207) $170^\circ \frac{17\pi}{18}$

208) $\frac{11\pi}{9}$

220°

209) $-\frac{29\pi}{6}$

210) $-140^\circ -\frac{7\pi}{9}$

-870°

211) $-\frac{3\pi}{2}$

212) $150^\circ \frac{5\pi}{6}$

-270°

213) $\frac{4\pi}{3}$

214) $90^\circ \frac{\pi}{2}$

240°

215) $-\frac{17\pi}{3}$

216) $-\frac{\pi}{3}$

-1020°

-60°

217) $-\frac{19\pi}{12}$

218) $-\frac{14\pi}{3}$

-285°

-840°

219) $\frac{16\pi}{9}$

220) $\frac{10\pi}{9}$

320°

200°

221) $\frac{7\pi}{12}$

222) $-300^\circ -\frac{5\pi}{3}$

105°

223) $\frac{2\pi}{3}$

224) $\frac{7\pi}{2}$

120°

630°

$$225) 420^\circ \frac{7\pi}{3}$$

$$227) 300^\circ \frac{5\pi}{3}$$

$$229) -600^\circ -\frac{10\pi}{3}$$

$$231) -210^\circ -\frac{7\pi}{6}$$

$$233) -285^\circ -\frac{19\pi}{12}$$

$$235) \frac{\pi}{4}$$

$$45^\circ$$

$$237) \frac{37\pi}{12}$$

$$555^\circ$$

$$239) 315^\circ \frac{7\pi}{4}$$

$$241) -\frac{3\pi}{4}$$

$$-135^\circ$$

$$243) -\frac{17\pi}{6}$$

$$-510^\circ$$

$$245) \frac{35\pi}{36}$$

$$175^\circ$$

$$247) 10^\circ \frac{\pi}{18}$$

$$249) 510^\circ \frac{17\pi}{6}$$

$$226) -\frac{95\pi}{36}$$

$$-475^\circ$$

$$228) 270^\circ \frac{3\pi}{2}$$

$$230) 195^\circ \frac{13\pi}{12}$$

$$232) 640^\circ \frac{32\pi}{9}$$

$$234) -240^\circ -\frac{4\pi}{3}$$

$$236) -\frac{16\pi}{3}$$

$$-960^\circ$$

$$238) 165^\circ \frac{11\pi}{12}$$

$$240) \frac{61\pi}{12}$$

$$915^\circ$$

$$242) 330^\circ \frac{11\pi}{6}$$

$$244) 60^\circ \frac{\pi}{3}$$

$$246) 945^\circ \frac{21\pi}{4}$$

$$248) 205^\circ \frac{41\pi}{36}$$

$$250) 680^\circ \frac{34\pi}{9}$$

Convert each radian measure into degrees.

$$251) \frac{9\pi}{4}$$

$$405^\circ$$

$$252) \frac{21\pi}{4}$$

$$945^\circ$$

$$253) -\frac{4\pi}{3}$$

$$-240^\circ$$

$$255) \frac{17\pi}{18}$$

$$170^\circ$$

$$257) \frac{5\pi}{18}$$

$$50^\circ$$

$$259) \frac{15\pi}{4}$$

$$675^\circ$$

$$261) \frac{\pi}{6}$$

$$30^\circ$$

$$263) -\frac{15\pi}{4}$$

$$-675^\circ$$

$$265) -\frac{11\pi}{6}$$

$$-330^\circ$$

$$267) \frac{5\pi}{4}$$

$$225^\circ$$

$$269) -\frac{5\pi}{3}$$

$$-300^\circ$$

$$271) -\frac{10\pi}{3}$$

$$-600^\circ$$

$$273) \frac{\pi}{3}$$

$$60^\circ$$

$$275) \frac{7\pi}{12}$$

$$105^\circ$$

$$254) \frac{5\pi}{2}$$

$$450^\circ$$

$$256) \frac{13\pi}{12}$$

$$195^\circ$$

$$258) \frac{17\pi}{3}$$

$$1020^\circ$$

$$260) -\frac{13\pi}{12}$$

$$-195^\circ$$

$$262) -\frac{8\pi}{3}$$

$$-480^\circ$$

$$264) -\frac{7\pi}{18}$$

$$-70^\circ$$

$$266) -\frac{17\pi}{12}$$

$$-255^\circ$$

$$268) \frac{5\pi}{3}$$

$$300^\circ$$

$$270) \frac{31\pi}{12}$$

$$465^\circ$$

$$272) -\frac{3\pi}{4}$$

$$-135^\circ$$

$$274) -\frac{2\pi}{3}$$

$$-120^\circ$$

$$276) \frac{19\pi}{12}$$

$$285^\circ$$

$$277) -\frac{7\pi}{6}$$

$$-210^\circ$$

$$279) \frac{8\pi}{3}$$

$$480^\circ$$

$$281) -\frac{37\pi}{18}$$

$$-370^\circ$$

$$283) \frac{85\pi}{36}$$

$$425^\circ$$

$$285) \frac{7\pi}{9}$$

$$140^\circ$$

$$287) \frac{145\pi}{36}$$

$$725^\circ$$

$$289) -\frac{5\pi}{6}$$

$$-150^\circ$$

$$291) -2\pi$$

$$-360^\circ$$

$$293) \frac{5\pi}{6}$$

$$150^\circ$$

$$295) \frac{20\pi}{9}$$

$$400^\circ$$

$$297) \frac{3\pi}{4}$$

$$135^\circ$$

$$299) \frac{11\pi}{18}$$

$$110^\circ$$

$$278) -\frac{7\pi}{2}$$

$$-630^\circ$$

$$280) -\frac{37\pi}{12}$$

$$-555^\circ$$

$$282) \frac{5\pi}{9}$$

$$100^\circ$$

$$284) -\frac{\pi}{2}$$

$$-90^\circ$$

$$286) -\frac{67\pi}{18}$$

$$-670^\circ$$

$$288) \frac{11\pi}{3}$$

$$660^\circ$$

$$290) \frac{11\pi}{6}$$

$$330^\circ$$

$$292) \frac{23\pi}{18}$$

$$230^\circ$$

$$294) \frac{53\pi}{12}$$

$$795^\circ$$

$$296) -\frac{5\pi}{4}$$

$$-225^\circ$$

$$298) -\frac{14\pi}{3}$$

$$-840^\circ$$

$$300) -\frac{29\pi}{18}$$

$$-290^\circ$$

State if the given angles are coterminal.

301) $40^\circ, -680^\circ$

Yes

303) $125^\circ, -485^\circ$

No

305) $80^\circ, 800^\circ$

Yes

307) $135^\circ, 855^\circ$

Yes

309) $165^\circ, 885^\circ$

Yes

311) $135^\circ, 495^\circ$

Yes

313) $140^\circ, -400^\circ$

No

315) $300^\circ, -240^\circ$

No

317) $335^\circ, 1055^\circ$

Yes

319) $255^\circ, -105^\circ$

Yes

321) $165^\circ, -375^\circ$

No

323) $60^\circ, 600^\circ$

No

325) $125^\circ, 225^\circ$

No

327) $340^\circ, 1060^\circ$

Yes

329) $20^\circ, -700^\circ$

Yes

331) $325^\circ, -35^\circ$

Yes

333) $170^\circ, 890^\circ$

Yes

335) $5^\circ, -365^\circ$

No

302) $270^\circ, 630^\circ$

Yes

304) $150^\circ, -210^\circ$

Yes

306) $315^\circ, -45^\circ$

Yes

308) $20^\circ, -380^\circ$

No

310) $290^\circ, 830^\circ$

No

312) $285^\circ, 645^\circ$

Yes

314) $315^\circ, -225^\circ$

No

316) $155^\circ, -45^\circ$

No

318) $235^\circ, -125^\circ$

Yes

320) $170^\circ, 530^\circ$

Yes

322) $175^\circ, -185^\circ$

Yes

324) $50^\circ, 250^\circ$

No

326) $35^\circ, -395^\circ$

No

328) $25^\circ, 385^\circ$

Yes

330) $165^\circ, 525^\circ$

Yes

332) $185^\circ, 725^\circ$

No

334) $55^\circ, 415^\circ$

Yes

336) $80^\circ, -280^\circ$

Yes

337) $205^\circ, 745^\circ$

No

339) $70^\circ, -290^\circ$

Yes

341) $305^\circ, -235^\circ$

No

343) $305^\circ, -665^\circ$

No

345) $150^\circ, -510^\circ$

No

347) $110^\circ, 470^\circ$

Yes

349) $315^\circ, 675^\circ$

Yes

338) $335^\circ, -695^\circ$

No

340) $340^\circ, -20^\circ$

Yes

342) $165^\circ, 365^\circ$

No

344) $110^\circ, 650^\circ$

No

346) $170^\circ, -130^\circ$

No

348) $45^\circ, 405^\circ$

Yes

350) $185^\circ, -535^\circ$

Yes

Find a coterminal angle between 0° and 360° .

351) -570°

150°

353) 555°

195°

355) 470°

110°

357) -70°

290°

359) -345°

15°

361) 575°

215°

363) 525°

165°

365) -225°

135°

367) -395°

325°

369) -46°

314°

371) -255°

105°

352) 960°

240°

354) -85°

275°

356) -512°

208°

358) -145°

215°

360) -415°

305°

362) 718°

358°

364) -435°

285°

366) 750°

30°

368) 480°

120°

370) -285°

75°

372) 570°

210°

373) 490°

130°

375) 635°

275°

377) -185°

175°

379) 705°

345°

381) 365°

5°

383) -292°

68°

385) 966°

246°

387) -150°

210°

389) 765°

45°

391) 446°

86°

393) -30°

330°

395) -212°

148°

397) -470°

250°

399) 915°

195°

374) -540°

180°

376) 666°

306°

378) -45°

315°

380) -315°

45°

382) 448°

88°

384) -135°

225°

386) -615°

105°

388) 840°

120°

390) 510°

150°

392) 965°

245°

394) -90°

270°

396) -242°

118°

398) -268°

92°

400) 762°

42°

Find a positive and a negative coterminal angle for each given angle.

401) $-\frac{7\pi}{4}$ $\frac{\pi}{4}$ and $-\frac{15\pi}{4}$

402) $-\frac{103\pi}{90}$ $\frac{77\pi}{90}$ and $-\frac{283\pi}{90}$

403) $-\frac{\pi}{12}$ $\frac{23\pi}{12}$ and $-\frac{25\pi}{12}$

404) $-\frac{71\pi}{36}$ $\frac{\pi}{36}$ and $-\frac{143\pi}{36}$

405) $-\frac{\pi}{4}$ $\frac{7\pi}{4}$ and $-\frac{9\pi}{4}$

406) $-\frac{7\pi}{12}$ $\frac{17\pi}{12}$ and $-\frac{31\pi}{12}$

407) $\frac{3\pi}{2}$ $\frac{7\pi}{2}$ and $-\frac{\pi}{2}$

408) $\frac{\pi}{9}$ $\frac{19\pi}{9}$ and $-\frac{17\pi}{9}$

409) $\frac{5\pi}{6}$ $\frac{17\pi}{6}$ and $-\frac{7\pi}{6}$

410) $\frac{17\pi}{6}$ $\frac{5\pi}{6}$ and $-\frac{7\pi}{6}$

411) $\frac{37\pi}{18}$ $\frac{\pi}{18}$ and $-\frac{35\pi}{18}$

412) $\frac{10\pi}{3}$ $\frac{4\pi}{3}$ and $-\frac{2\pi}{3}$

413) $\frac{13\pi}{45}$ $\frac{103\pi}{45}$ and $-\frac{77\pi}{45}$

414) $-\frac{23\pi}{12}$ $\frac{\pi}{12}$ and $-\frac{47\pi}{12}$

415) $-\frac{3\pi}{4}$ $\frac{5\pi}{4}$ and $-\frac{11\pi}{4}$

416) $-\frac{67\pi}{90}$ $\frac{113\pi}{90}$ and $-\frac{247\pi}{90}$

417) $-\frac{47\pi}{36}$ $\frac{25\pi}{36}$ and $-\frac{119\pi}{36}$

418) $-\frac{17\pi}{12}$ $\frac{7\pi}{12}$ and $-\frac{41\pi}{12}$

419) $-\frac{5\pi}{4}$ $\frac{3\pi}{4}$ and $-\frac{13\pi}{4}$

420) $\frac{19\pi}{12}$ $\frac{43\pi}{12}$ and $-\frac{5\pi}{12}$

421) $-\frac{121\pi}{90}$ $\frac{59\pi}{90}$ and $-\frac{301\pi}{90}$

422) $-\frac{31\pi}{12}$ $\frac{17\pi}{12}$ and $-\frac{7\pi}{12}$

423) $\frac{2\pi}{3}$ $\frac{8\pi}{3}$ and $-\frac{4\pi}{3}$

424) $\frac{14\pi}{9}$ $\frac{32\pi}{9}$ and $-\frac{4\pi}{9}$

425) $\frac{29\pi}{9}$ $\frac{11\pi}{9}$ and $-\frac{7\pi}{9}$

426) 2π
 0 and -2π

427) $-\frac{5\pi}{12}$ $\frac{19\pi}{12}$ and $-\frac{29\pi}{12}$

428) $-\frac{29\pi}{9}$ $\frac{7\pi}{9}$ and $-\frac{11\pi}{9}$

429) $\frac{64\pi}{45}$ $\frac{154\pi}{45}$ and $-\frac{26\pi}{45}$

430) $\frac{31\pi}{9}$ $\frac{13\pi}{9}$ and $-\frac{5\pi}{9}$

431) $\frac{5\pi}{4}$ $\frac{13\pi}{4}$ and $-\frac{3\pi}{4}$

432) $\frac{4\pi}{3}$ $\frac{10\pi}{3}$ and $-\frac{2\pi}{3}$

433) $\frac{23\pi}{18}$ $\frac{59\pi}{18}$ and $-\frac{13\pi}{18}$

434) $\frac{5\pi}{2}$ $\frac{\pi}{2}$ and $-\frac{3\pi}{2}$

435) $-\frac{7\pi}{18}$ $\frac{29\pi}{18}$ and $-\frac{43\pi}{18}$

436) $\frac{11\pi}{6}$ $\frac{23\pi}{6}$ and $-\frac{\pi}{6}$

437) $-\frac{5\pi}{6}$ $\frac{7\pi}{6}$ and $-\frac{17\pi}{6}$

438) $-\frac{101\pi}{90}$ $\frac{79\pi}{90}$ and $-\frac{281\pi}{90}$

439) $\frac{31\pi}{36}$ $\frac{103\pi}{36}$ and $-\frac{41\pi}{36}$

440) $-\frac{15\pi}{4}$ $\frac{\pi}{4}$ and $-\frac{7\pi}{4}$

441) $-\frac{35\pi}{18}$ $\frac{\pi}{18}$ and $-\frac{71\pi}{18}$

442) 0
 2π and -2π

443) $\frac{11\pi}{12}$ $\frac{35\pi}{12}$ and $-\frac{13\pi}{12}$

444) $\frac{13\pi}{9}$ $\frac{31\pi}{9}$ and $-\frac{5\pi}{9}$

445) $\frac{55\pi}{36}$ $\frac{127\pi}{36}$ and $-\frac{17\pi}{36}$

446) $-\frac{26\pi}{9}$ $\frac{10\pi}{9}$ and $-\frac{8\pi}{9}$

447) $\frac{7\pi}{6}$ $\frac{19\pi}{6}$ and $-\frac{5\pi}{6}$

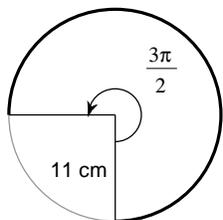
448) $\frac{118\pi}{45}$ $\frac{28\pi}{45}$ and $-\frac{62\pi}{45}$

449) $-\frac{19\pi}{12}$ $\frac{5\pi}{12}$ and $-\frac{43\pi}{12}$

450) $-\frac{11\pi}{6}$ $\frac{\pi}{6}$ and $-\frac{23\pi}{6}$

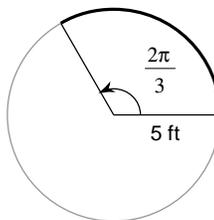
Find the length of each arc. Round your answers to the nearest tenth.

451)



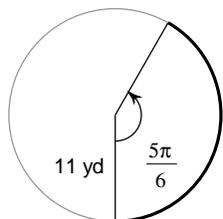
51.8 cm

452)



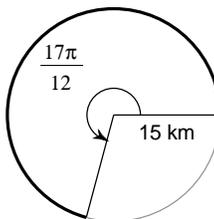
10.5 ft

453)



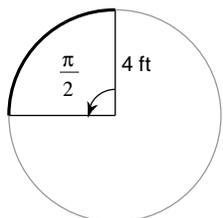
28.8 yd

454)



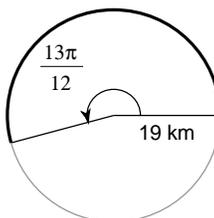
66.8 km

455)



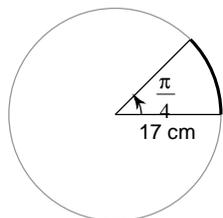
6.3 ft

456)



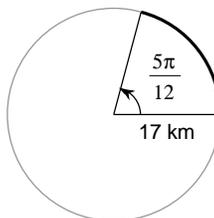
64.7 km

457)



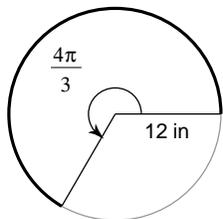
13.4 cm

458)



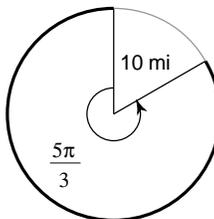
22.3 km

459)



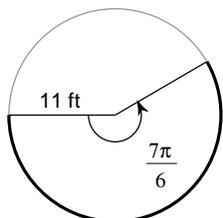
50.3 in

460)



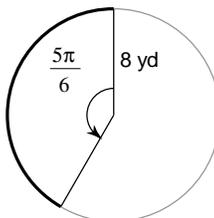
52.4 mi

461)



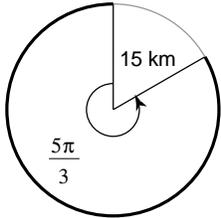
40.3 ft

462)



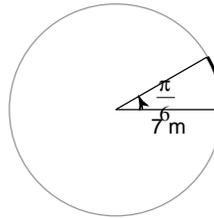
20.9 yd

463)



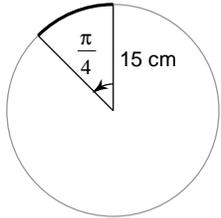
78.5 km

464)



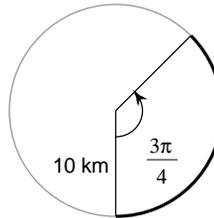
3.7 m

465)



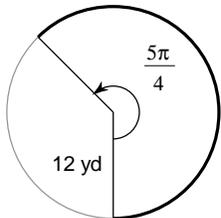
11.8 cm

466)



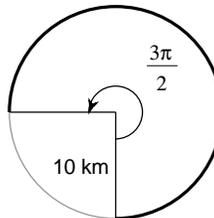
23.6 km

467)



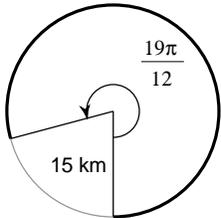
47.1 yd

468)



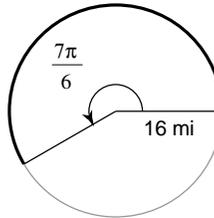
47.1 km

469)



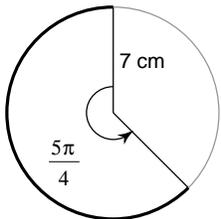
74.6 km

470)



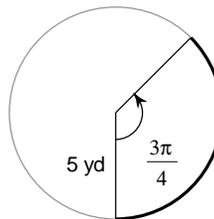
58.6 mi

471)



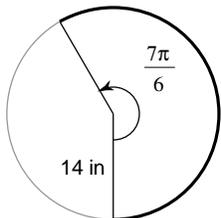
27.5 cm

472)



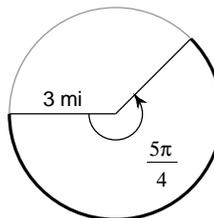
11.8 yd

473)



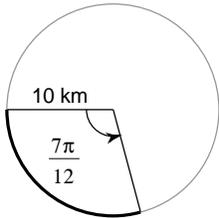
51.3 in

474)



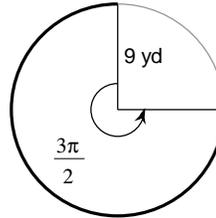
11.8 mi

475)



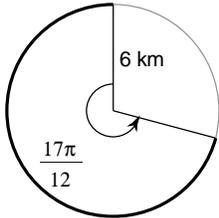
18.3 km

476)



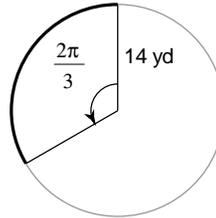
42.4 yd

477)



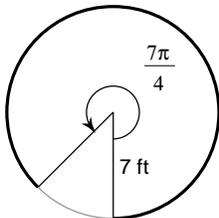
26.7 km

478)



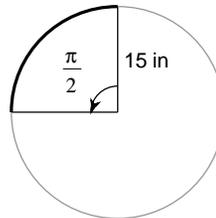
29.3 yd

479)



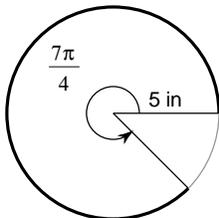
38.5 ft

480)



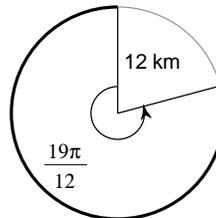
23.6 in

481)



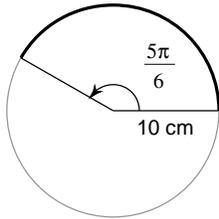
27.5 in

482)



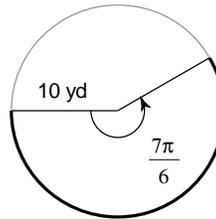
59.7 km

483)



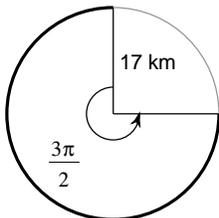
26.2 cm

484)



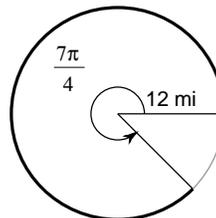
36.7 yd

485)



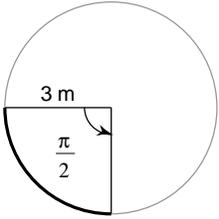
80.1 km

486)



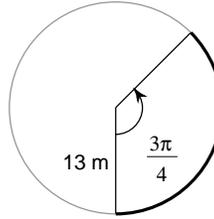
66.0 mi

487)



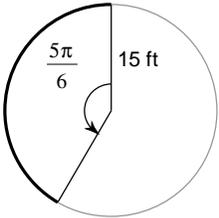
4.7 m

488)



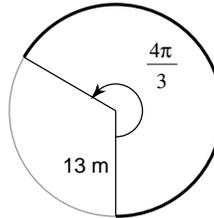
30.6 m

489)



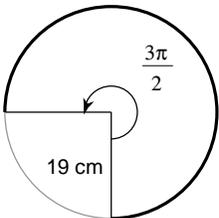
39.3 ft

490)



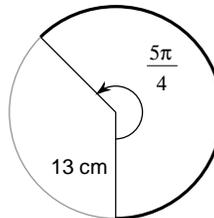
54.5 m

491)



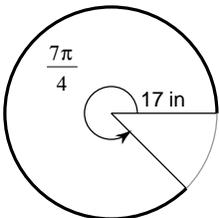
89.5 cm

492)



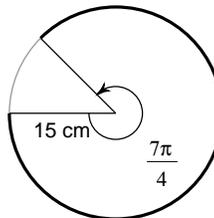
51.1 cm

493)



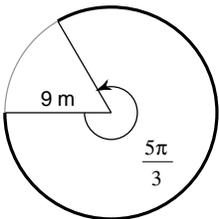
93.5 in

494)



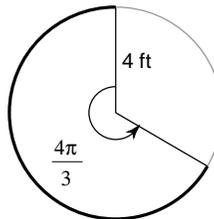
82.5 cm

495)



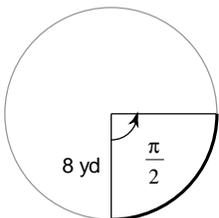
47.1 m

496)



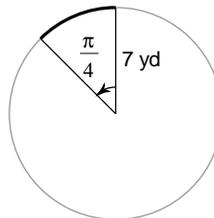
16.8 ft

497)



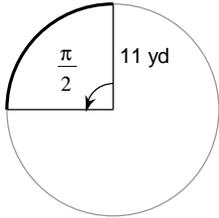
12.6 yd

498)



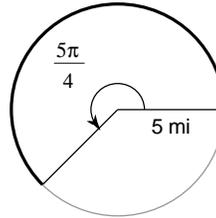
5.5 yd

499)



17.3 yd

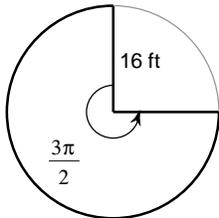
500)



19.6 mi

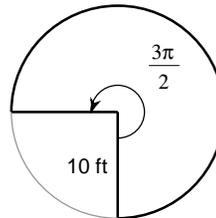
Find the area of each sector.

501)



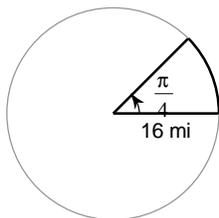
192π ft²

502)



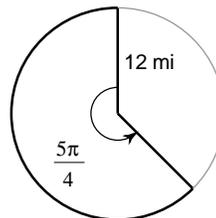
75π ft²

503)



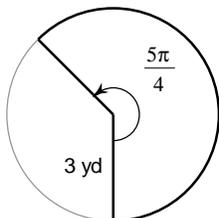
32π mi²

504)



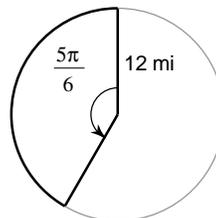
90π mi²

505)



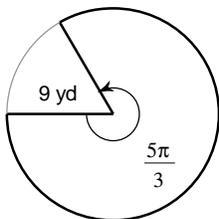
$\frac{45\pi}{8}$ yd²

506)



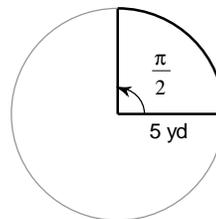
60π mi²

507)



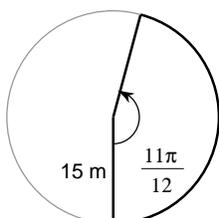
$\frac{135\pi}{2}$ yd²

508)



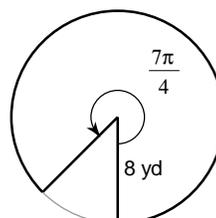
$\frac{25\pi}{4}$ yd²

509)



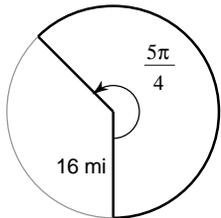
$\frac{825\pi}{8}$ m²

510)



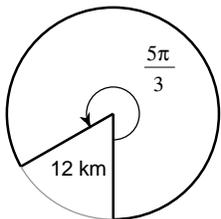
56π yd²

511)



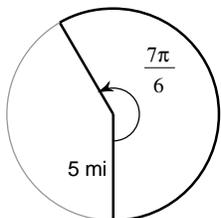
$$160\pi \text{ mi}^2$$

513)



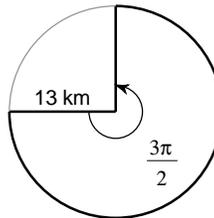
$$120\pi \text{ km}^2$$

515)



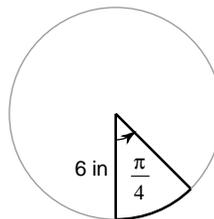
$$\frac{175\pi}{12} \text{ mi}^2$$

512)



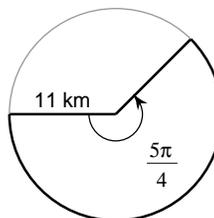
$$\frac{507\pi}{4} \text{ km}^2$$

514)



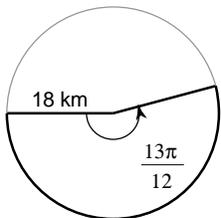
$$\frac{9\pi}{2} \text{ in}^2$$

516)



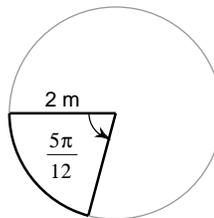
$$\frac{605\pi}{8} \text{ km}^2$$

517)



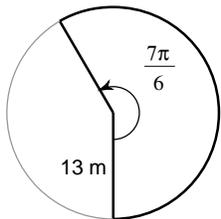
$$\frac{351\pi}{2} \text{ km}^2$$

518)



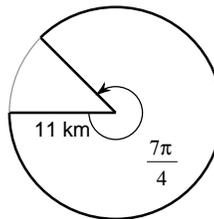
$$\frac{5\pi}{6} \text{ m}^2$$

519)



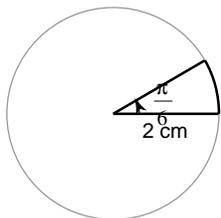
$$\frac{1183\pi}{12} \text{ m}^2$$

520)



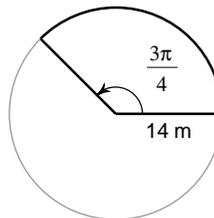
$$\frac{847\pi}{8} \text{ km}^2$$

521)

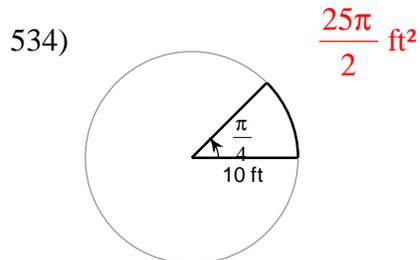
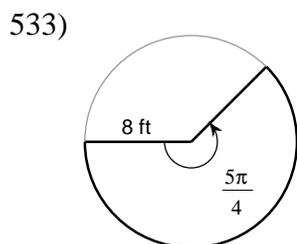
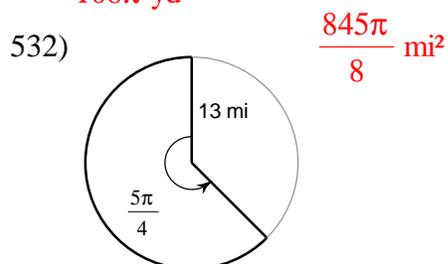
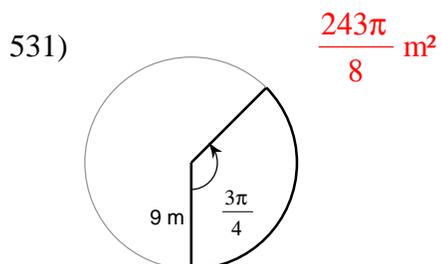
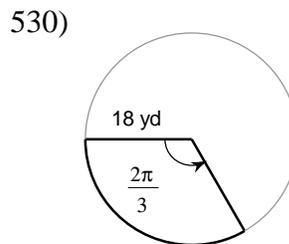
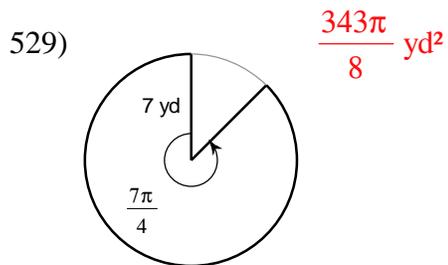
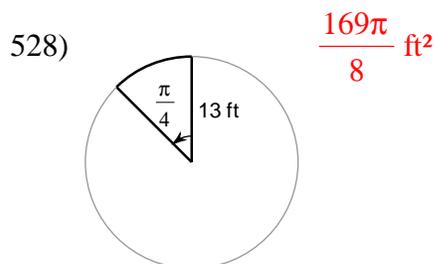
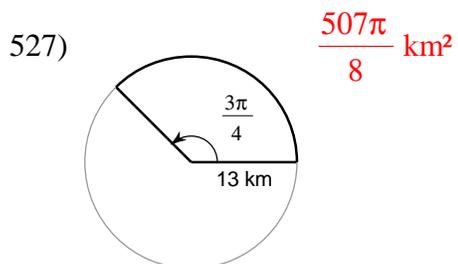
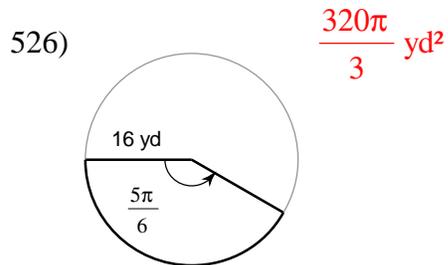
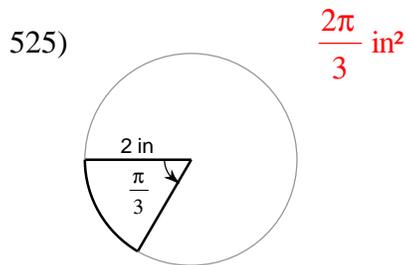
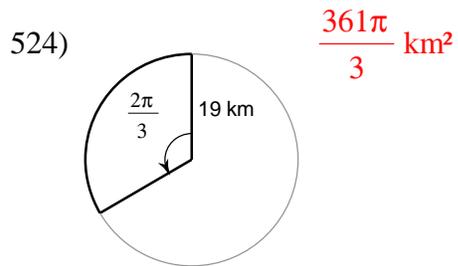
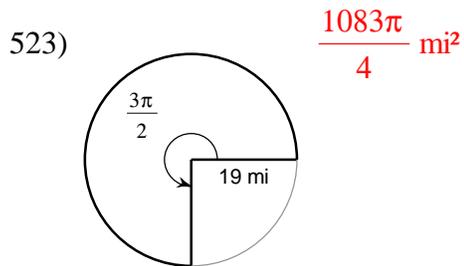


$$\frac{\pi}{3} \text{ cm}^2$$

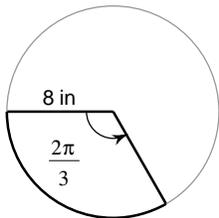
522)



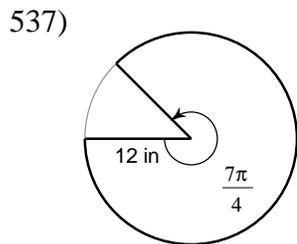
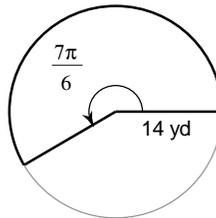
$$\frac{147\pi}{2} \text{ m}^2$$



535) $\frac{64\pi}{3} \text{ in}^2$

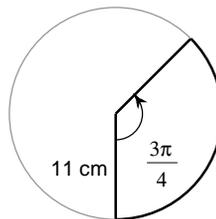


536) $\frac{343\pi}{3} \text{ yd}^2$

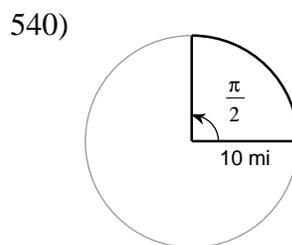
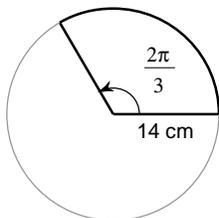


$126\pi \text{ in}^2$

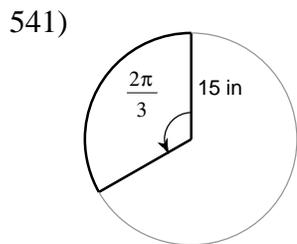
538) $\frac{363\pi}{8} \text{ cm}^2$



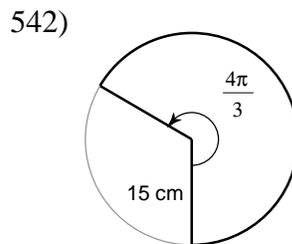
539) $\frac{196\pi}{3} \text{ cm}^2$



$25\pi \text{ mi}^2$

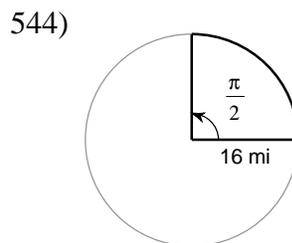
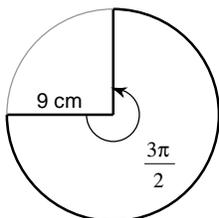


$75\pi \text{ in}^2$

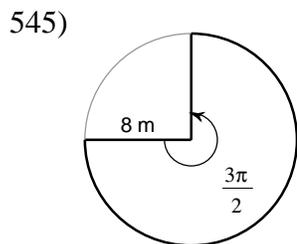


$150\pi \text{ cm}^2$

543) $\frac{243\pi}{4} \text{ cm}^2$

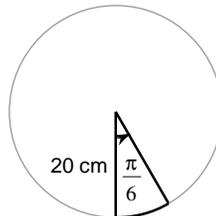


$64\pi \text{ mi}^2$

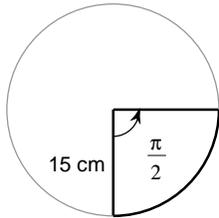


$48\pi \text{ m}^2$

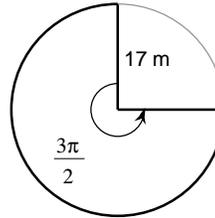
546) $\frac{100\pi}{3} \text{ cm}^2$



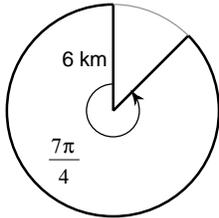
547) $\frac{225\pi}{4} \text{ cm}^2$



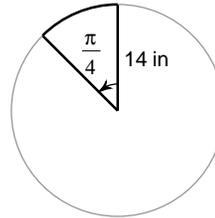
548) $\frac{867\pi}{4} \text{ m}^2$



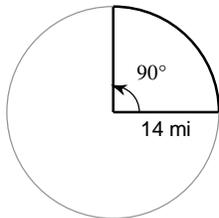
549) $\frac{63\pi}{2} \text{ km}^2$



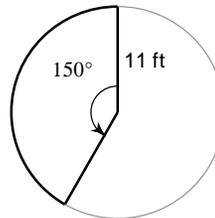
550) $\frac{49\pi}{2} \text{ in}^2$



551)

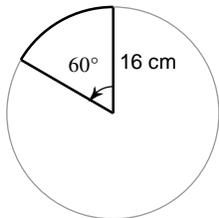


552) $\frac{605\pi}{12} \text{ ft}^2$

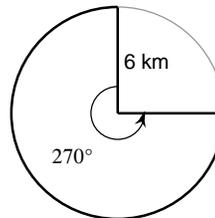


$49\pi \text{ mi}^2$

553) $\frac{128\pi}{3} \text{ cm}^2$

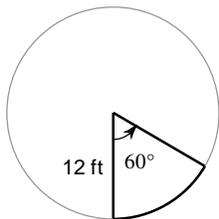


554)

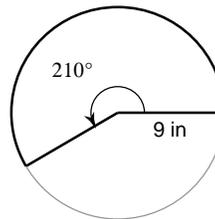


$27\pi \text{ km}^2$

555)

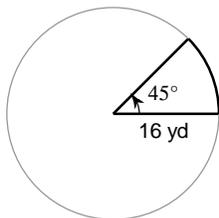


556) $\frac{189\pi}{4} \text{ in}^2$

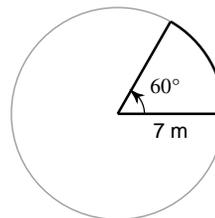


$24\pi \text{ ft}^2$

557)

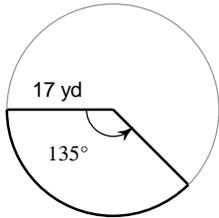


558) $\frac{49\pi}{6} \text{ m}^2$

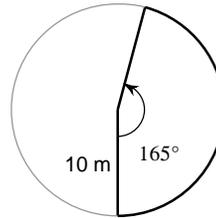


$32\pi \text{ yd}^2$

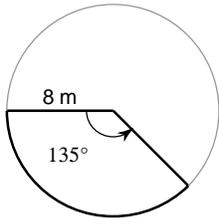
559) $\frac{867\pi}{8} \text{ yd}^2$



560) $\frac{275\pi}{6} \text{ m}^2$

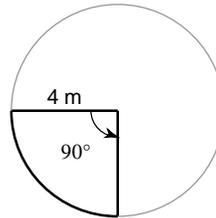


561)



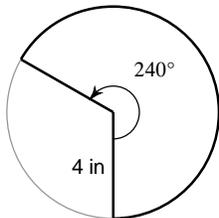
$24\pi \text{ m}^2$

562)

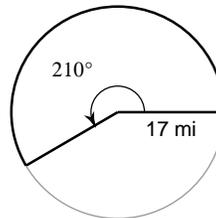


$4\pi \text{ m}^2$

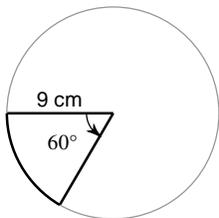
563) $\frac{32\pi}{3} \text{ in}^2$



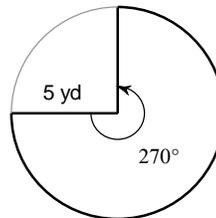
564) $\frac{2023\pi}{12} \text{ mi}^2$



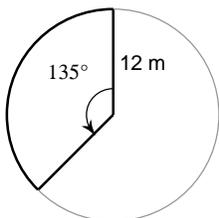
565) $\frac{27\pi}{2} \text{ cm}^2$



566) $\frac{75\pi}{4} \text{ yd}^2$

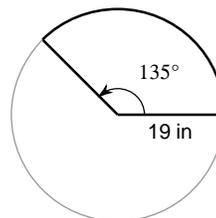


567)

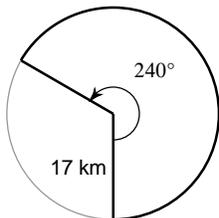


$54\pi \text{ m}^2$

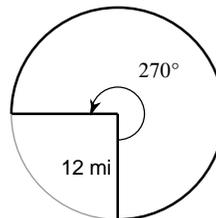
568) $\frac{1083\pi}{8} \text{ in}^2$



569) $\frac{578\pi}{3} \text{ km}^2$

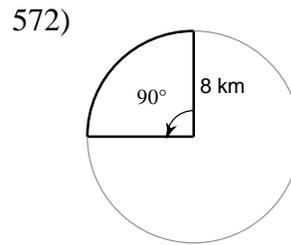
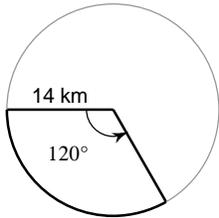


570)

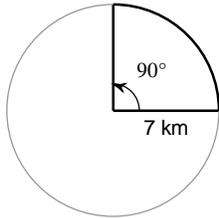


$108\pi \text{ mi}^2$

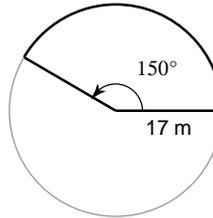
571) $\frac{196\pi}{3} \text{ km}^2$



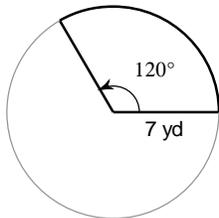
573) $\frac{49\pi}{4} \text{ km}^2$



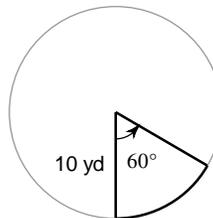
574) $\frac{1445\pi}{12} \text{ m}^2$



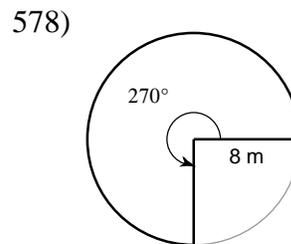
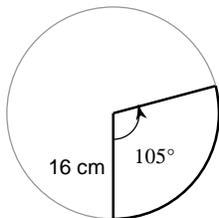
575) $\frac{49\pi}{3} \text{ yd}^2$



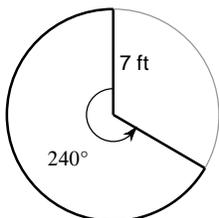
576) $\frac{50\pi}{3} \text{ yd}^2$



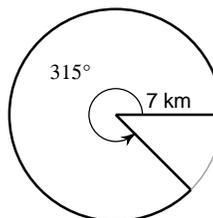
577) $\frac{224\pi}{3} \text{ cm}^2$



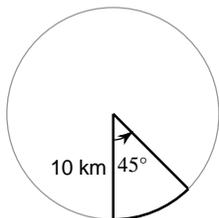
579) $\frac{98\pi}{3} \text{ ft}^2$



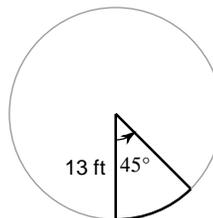
580) $\frac{343\pi}{8} \text{ km}^2$



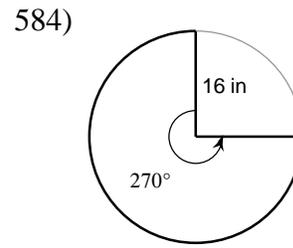
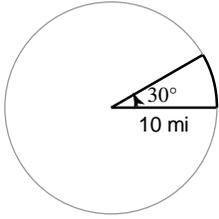
581) $\frac{25\pi}{2} \text{ km}^2$



582) $\frac{169\pi}{8} \text{ ft}^2$

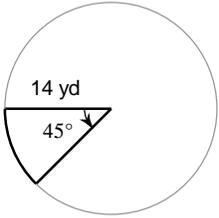


583) $\frac{25\pi}{3} \text{ mi}^2$

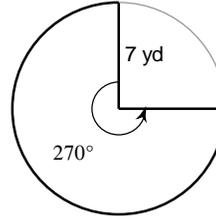


$192\pi \text{ in}^2$

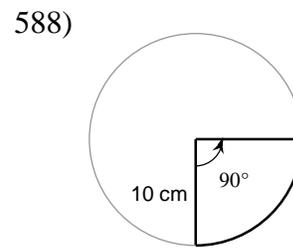
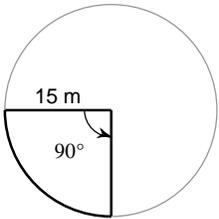
585) $\frac{49\pi}{2} \text{ yd}^2$



586) $\frac{147\pi}{4} \text{ yd}^2$

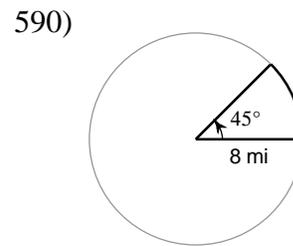
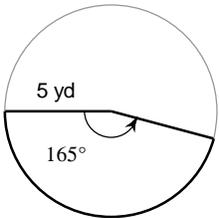


587) $\frac{225\pi}{4} \text{ m}^2$

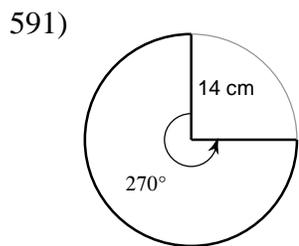


$25\pi \text{ cm}^2$

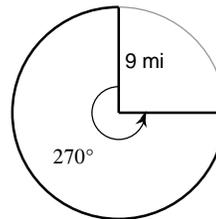
589) $\frac{275\pi}{24} \text{ yd}^2$



$8\pi \text{ mi}^2$

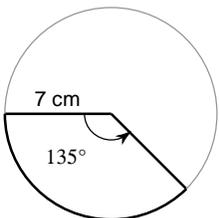


592) $\frac{243\pi}{4} \text{ mi}^2$

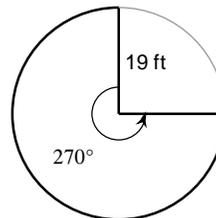


$147\pi \text{ cm}^2$

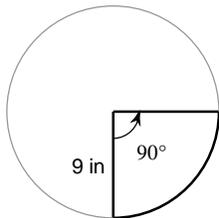
593) $\frac{147\pi}{8} \text{ cm}^2$



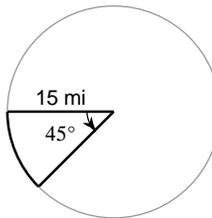
594) $\frac{1083\pi}{4} \text{ ft}^2$



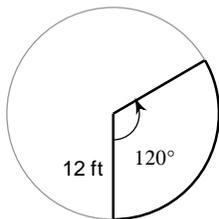
595) $\frac{81\pi}{4} \text{ in}^2$



596) $\frac{225\pi}{8} \text{ mi}^2$

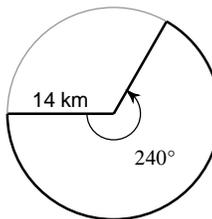


597)



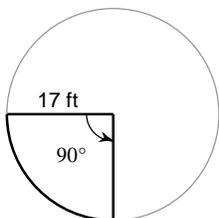
$48\pi \text{ ft}^2$

598)



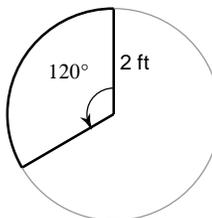
$\frac{392\pi}{3} \text{ km}^2$

599)



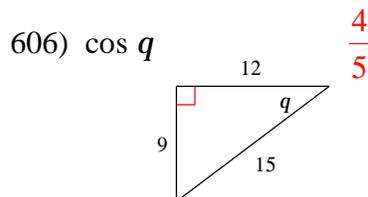
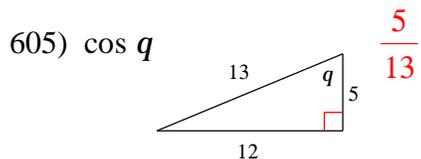
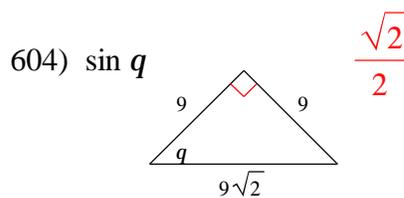
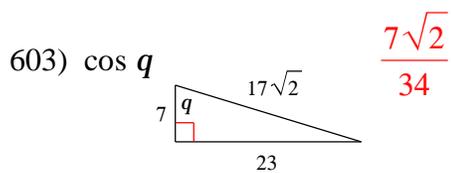
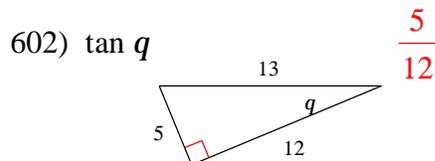
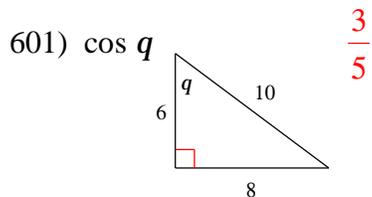
$\frac{289\pi}{4} \text{ ft}^2$

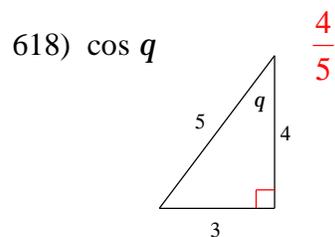
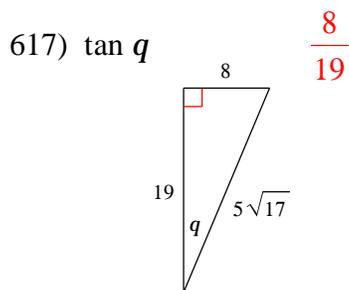
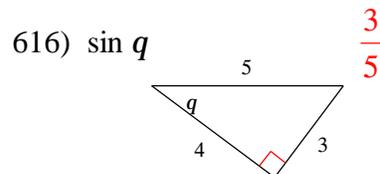
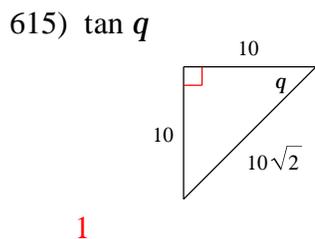
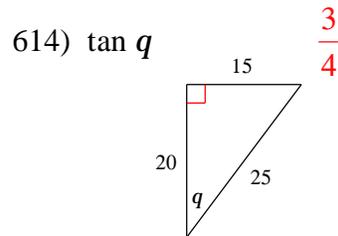
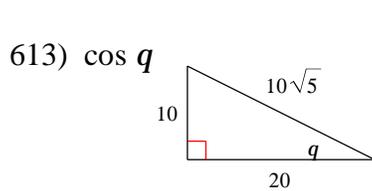
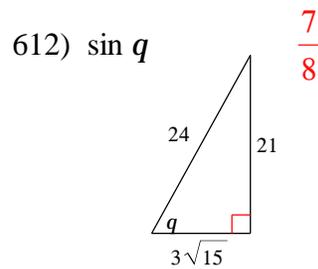
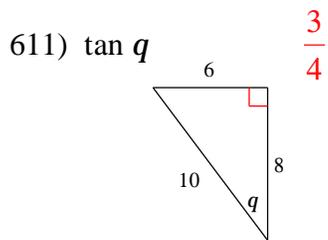
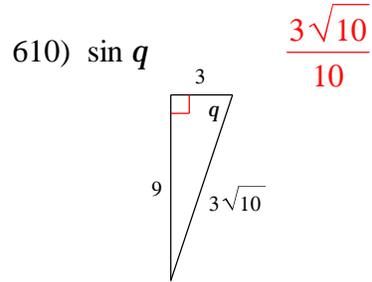
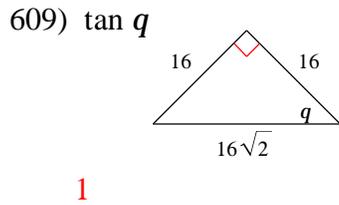
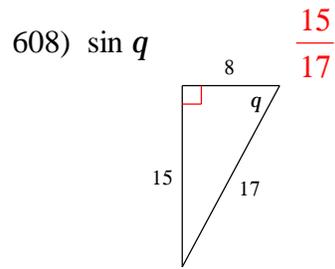
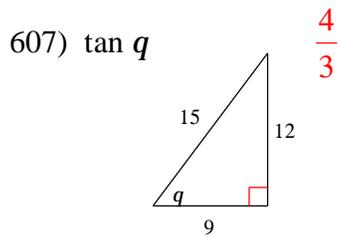
600)

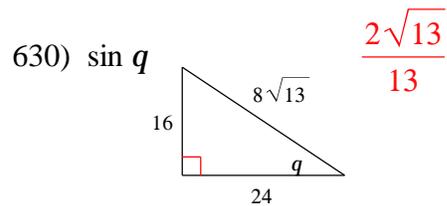
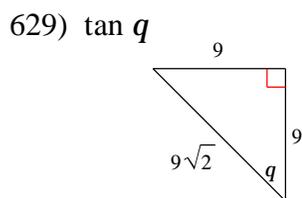
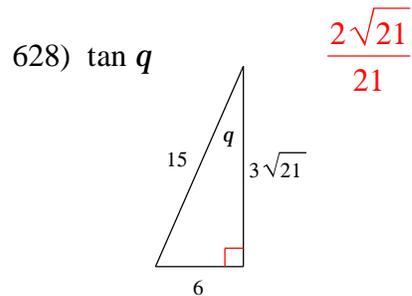
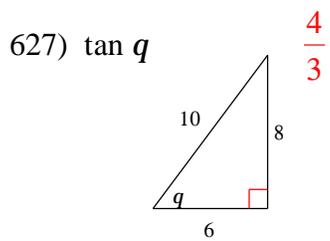
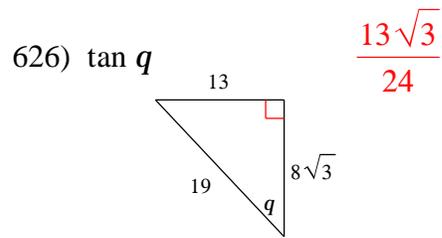
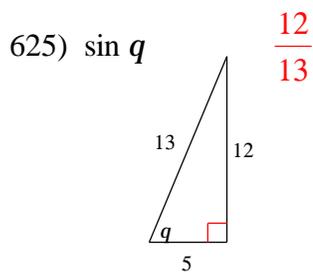
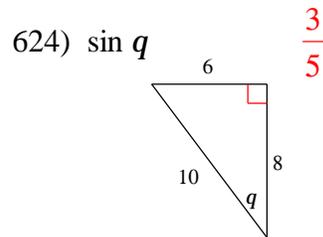
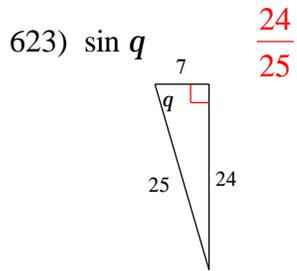
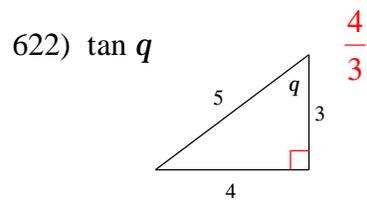
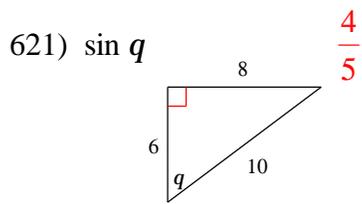
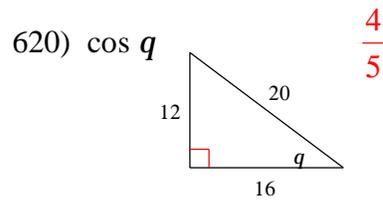
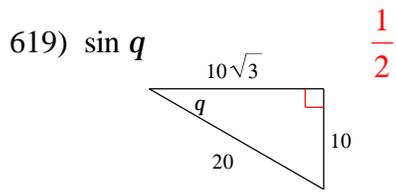


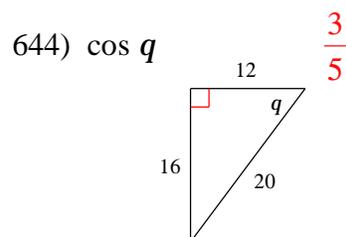
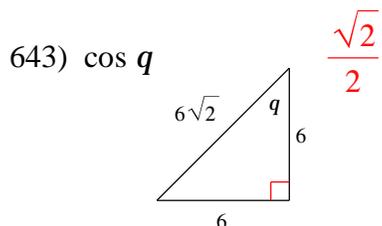
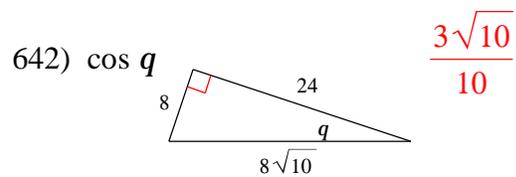
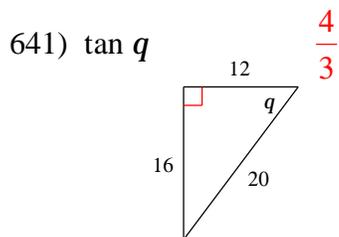
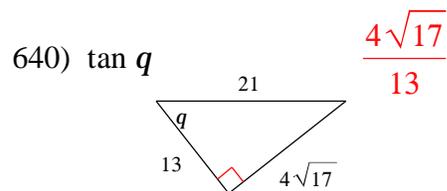
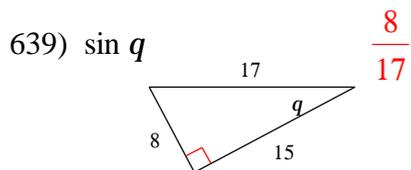
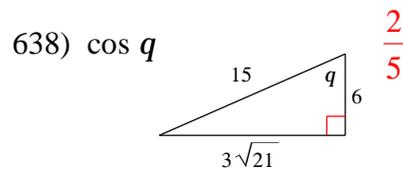
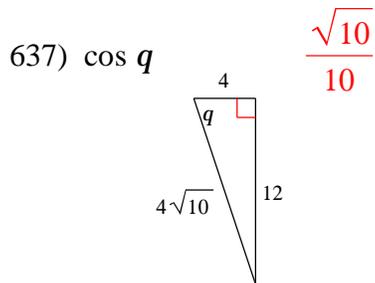
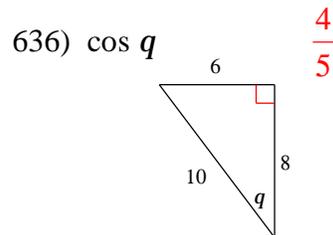
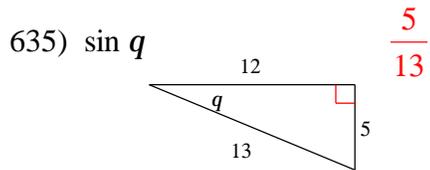
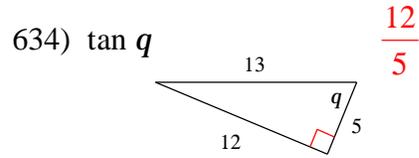
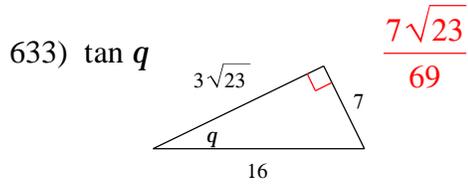
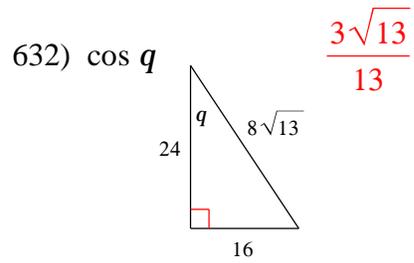
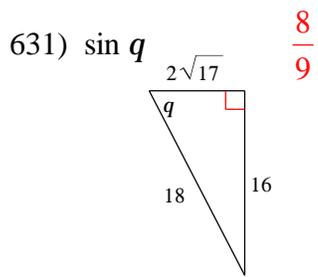
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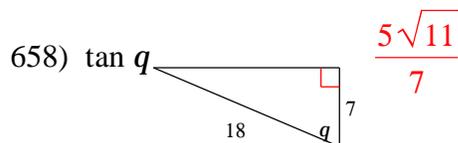
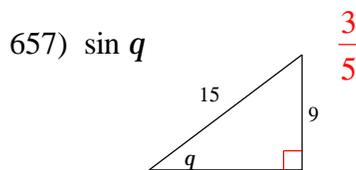
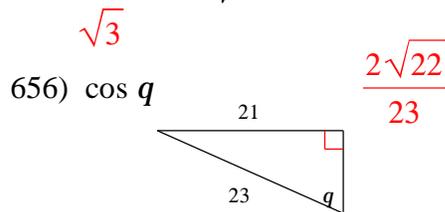
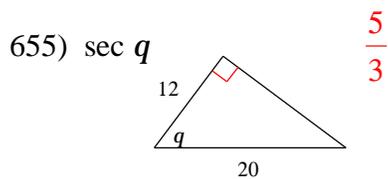
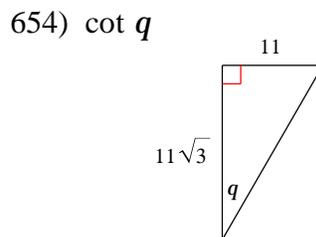
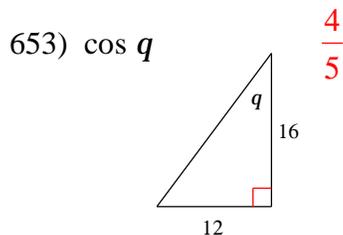
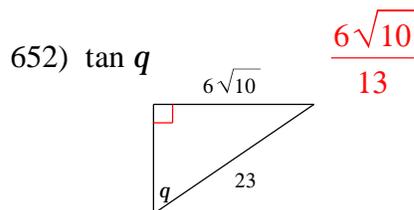
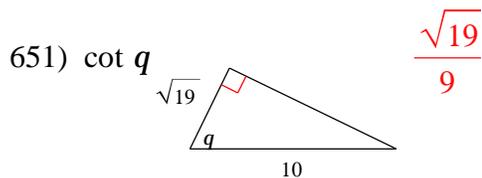
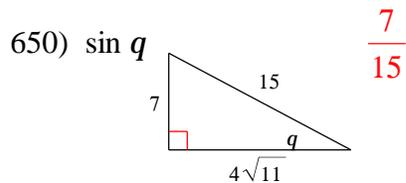
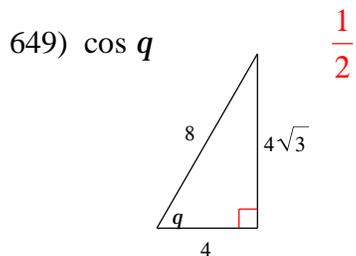
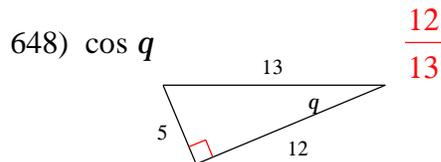
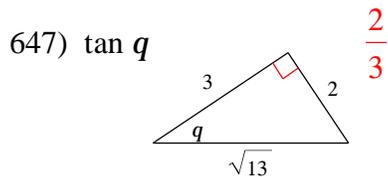
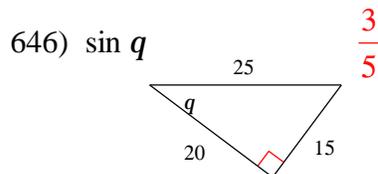
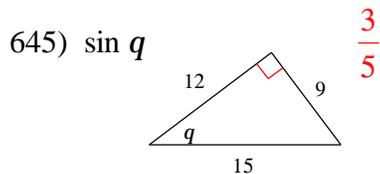
Find the value of the trig function indicated.



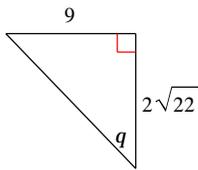




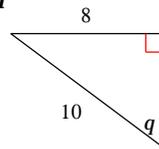




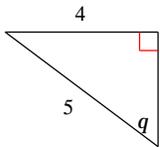
659) $\cos q = \frac{2\sqrt{22}}{13}$



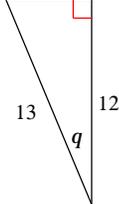
660) $\csc q = \frac{5}{4}$



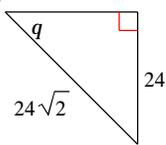
661) $\sin q = \frac{4}{5}$



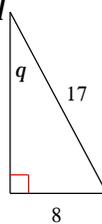
662) $\sin q = \frac{5}{13}$



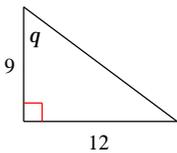
663) $\sin q = \frac{\sqrt{2}}{2}$



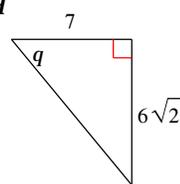
664) $\tan q = \frac{8}{15}$



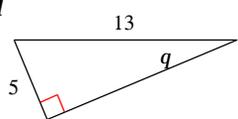
665) $\sin q = \frac{4}{5}$



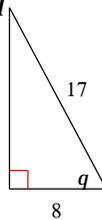
666) $\sec q = \frac{11}{7}$



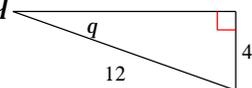
667) $\tan q = \frac{5}{12}$



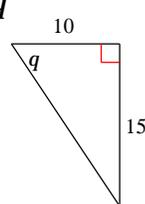
668) $\tan q = \frac{15}{8}$

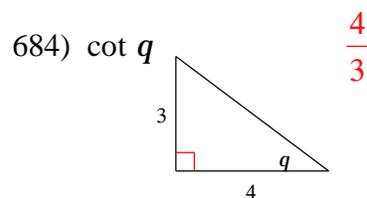
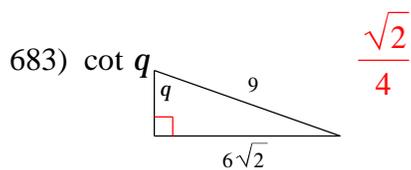
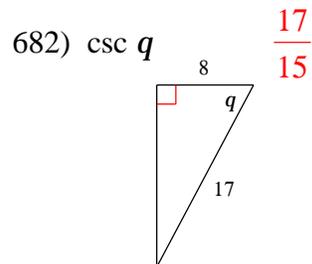
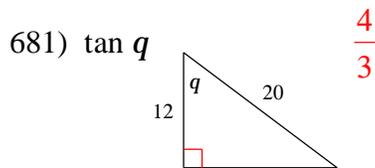
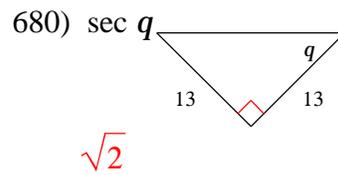
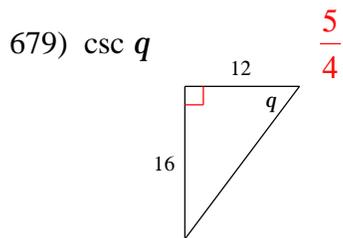
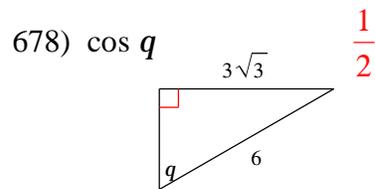
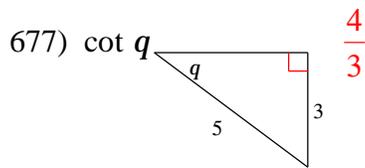
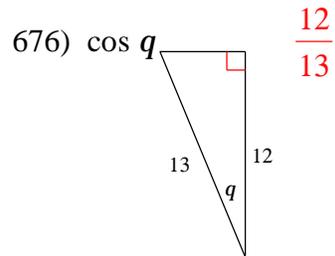
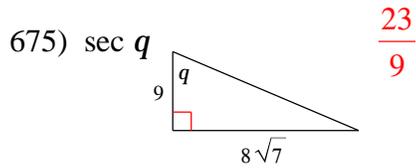
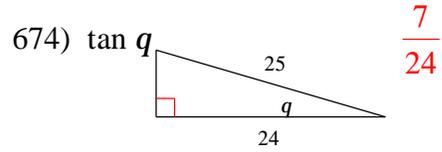
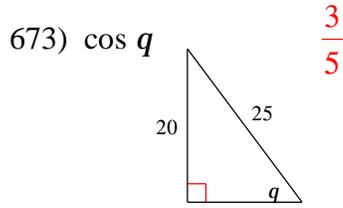
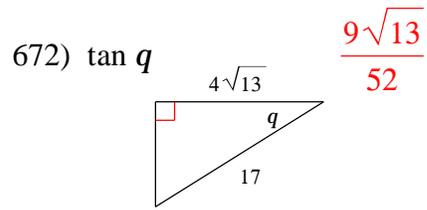
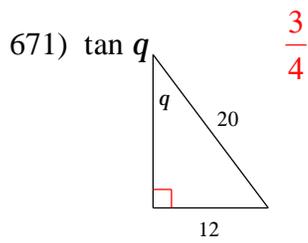


669) $\cos q = \frac{2\sqrt{2}}{3}$

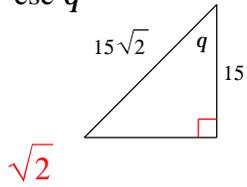


670) $\csc q = \frac{\sqrt{13}}{3}$

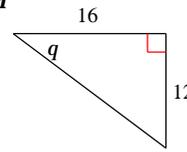




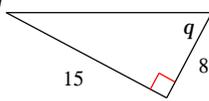
685) $\csc q$



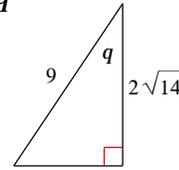
686) $\tan q$ $\frac{3}{4}$



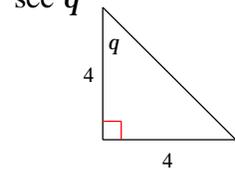
687) $\sin q$ $\frac{15}{17}$



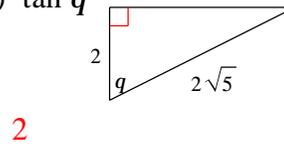
688) $\sec q$ $\frac{9\sqrt{14}}{28}$



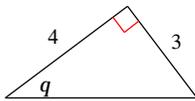
689) $\sec q$



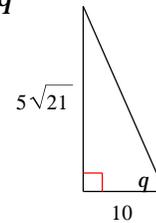
690) $\tan q$



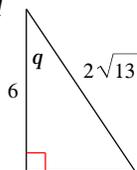
691) $\csc q$ $\frac{5}{3}$



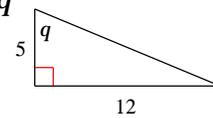
692) $\cos q$ $\frac{2}{5}$



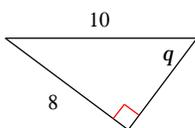
693) $\cos q$ $\frac{3\sqrt{13}}{13}$



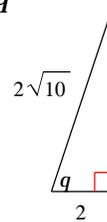
694) $\sin q$ $\frac{12}{13}$



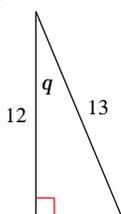
695) $\sec q$ $\frac{5}{3}$

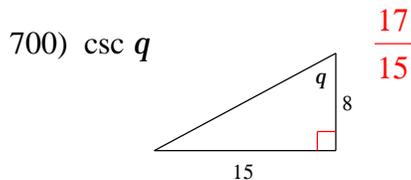
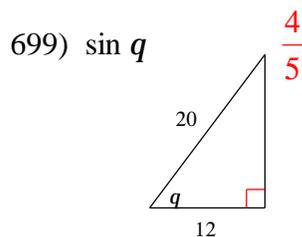
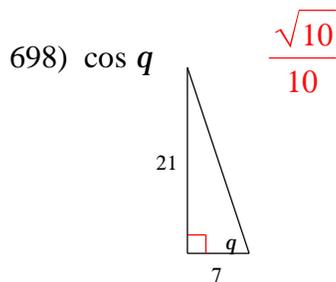


696) $\cot q$ $\frac{1}{3}$



697) $\cot q$ $\frac{12}{5}$





701) Find $\sin q$ if $\sec q = \frac{25}{24} \frac{7}{25}$

702) Find $\cos q$ if $\csc q = \frac{5}{3} \frac{4}{5}$

703) Find $\csc q$ if $\cot q = \frac{12}{5} \frac{13}{5}$

704) Find $\sin q$ if $\csc q = \frac{5}{4} \frac{4}{5}$

705) Find $\tan q$ if $\cos q = \frac{12}{13} \frac{5}{12}$

706) Find $\tan q$ if $\csc q = \frac{\sqrt{13}}{3} \frac{3}{2}$

707) Find $\sin q$ if $\csc q = \frac{\sqrt{10}}{3} \frac{3\sqrt{10}}{10}$

708) Find $\sin q$ if $\cot q = \frac{3}{4} \frac{4}{5}$

709) Find $\cos q$ if $\csc q = \frac{7}{5} \frac{2\sqrt{6}}{7}$

710) Find $\sec q$ if $\cos q = \frac{15}{17} \frac{17}{15}$

711) Find $\sin q$ if $\sec q = \frac{5}{4} \frac{3}{5}$

712) Find $\csc q$ if $\sin q = \frac{3\sqrt{13}}{13} \frac{\sqrt{13}}{3}$

713) Find $\cot q$ if $\cos q = \frac{24}{25} \frac{24}{7}$

714) Find $\sec q$ if $\sin q = \frac{4}{5} \frac{5}{3}$

715) Find $\cos q$ if $\sin q = \frac{15}{17} \frac{8}{17}$

716) Find $\cot q$ if $\sec q = \frac{5\sqrt{5}}{11} \frac{11}{2}$

717) Find $\csc q$ if $\sin q = \frac{4}{5} \frac{5}{4}$

718) Find $\csc q$ if $\sin q = \frac{3}{5} \frac{5}{3}$

719) Find $\cot q$ if $\sin q = \frac{4}{5} \frac{3}{4}$

720) Find $\tan q$ if $\cot q = \frac{3}{4} \frac{4}{3}$

721) Find $\tan q$ if $\cos q = \frac{4}{5} \frac{3}{4}$

722) Find $\cot q$ if $\sin q = \frac{3\sqrt{13}}{11} \frac{2\sqrt{13}}{39}$

723) Find $\sec q$ if $\cos q = \frac{\sqrt{2}}{2}$

724) Find $\csc q$ if $\tan q = \frac{\sqrt{3}}{12}$

725) Find $\sin q$ if $\cot q = 1 \frac{\sqrt{2}}{2}$

7

726) Find $\sec q$ if $\cos q = \frac{12}{13} \frac{13}{12}$

727) Find $\csc q$ if $\sec q = 2 \frac{2\sqrt{3}}{3}$

728) Find $\tan q$ if $\csc q = \sqrt{5} \frac{1}{2}$

729) Find $\sec q$ if $\cos q = \frac{2\sqrt{5}}{5} \frac{\sqrt{5}}{2}$

730) Find $\sin q$ if $\tan q = \frac{2}{3} \frac{2\sqrt{13}}{13}$

731) Find $\tan q$ if $\csc q = \frac{25}{24} \frac{24}{7}$

732) Find $\cot q$ if $\tan q = \frac{\sqrt{15}}{15}$

733) Find $\tan q$ if $\cos q = \frac{6\sqrt{13}}{65} \frac{17}{6}$

$\sqrt{15}$

734) Find $\csc q$ if $\cos q = \frac{5}{7} \frac{7\sqrt{6}}{12}$

735) Find $\sin q$ if $\csc q = \frac{\sqrt{13}}{2} \frac{2\sqrt{13}}{13}$

736) Find $\sin q$ if $\tan q = \frac{8}{15} \frac{8}{17}$

737) Find $\tan q$ if $\cot q = \frac{12}{5} \frac{5}{12}$

738) Find $\tan q$ if $\sin q = \frac{3\sqrt{10}}{10}$

739) Find $\cos q$ if $\sec q = \frac{19}{13} \frac{13}{19}$

3

740) Find $\sec q$ if $\cos q = \frac{3}{5} \frac{5}{3}$

741) Find $\sec q$ if $\tan q = \frac{5}{12} \frac{13}{12}$

742) Find $\csc q$ if $\cos q = \frac{3}{5} \frac{5}{4}$

743) Find $\sin q$ if $\csc q = \frac{14}{13} \frac{13}{14}$

744) Find $\tan q$ if $\sec q = \frac{17}{15} \frac{8}{15}$

745) Find $\sec q$ if $\tan q = \frac{3}{4} \frac{5}{4}$

746) Find $\csc q$ if $\sec q = \frac{5}{4} \frac{5}{3}$

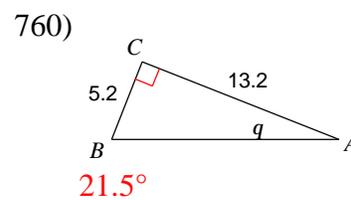
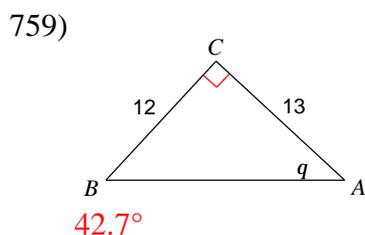
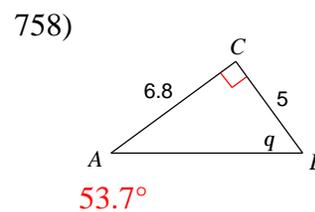
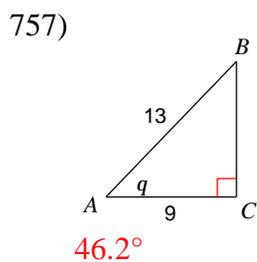
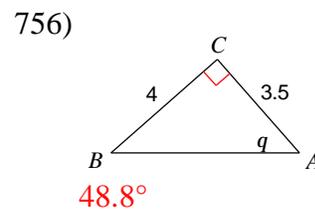
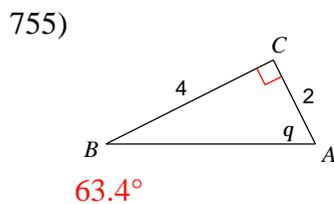
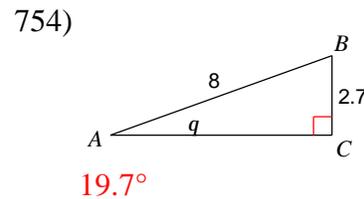
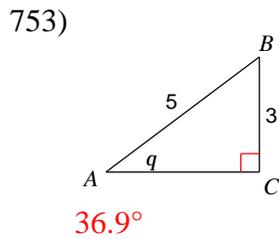
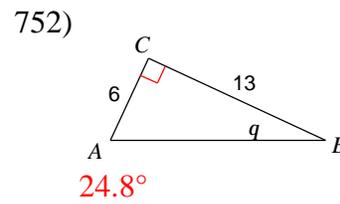
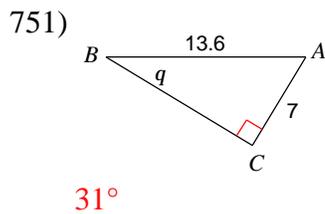
747) Find $\cos q$ if $\tan q = \frac{7\sqrt{2}}{12} \frac{6\sqrt{2}}{11}$

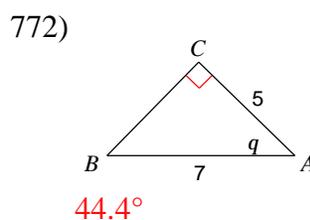
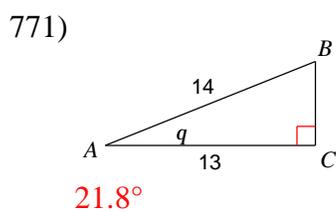
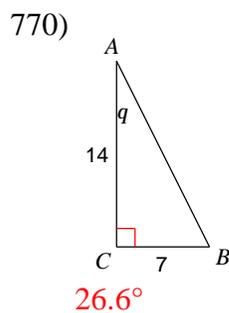
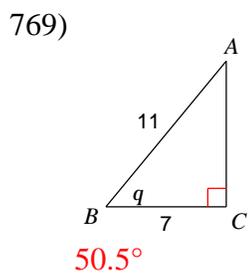
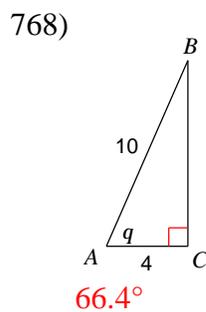
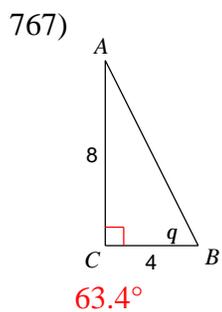
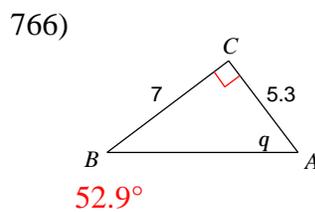
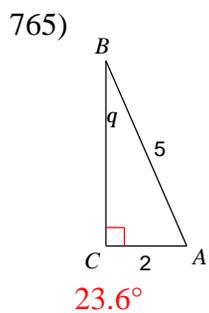
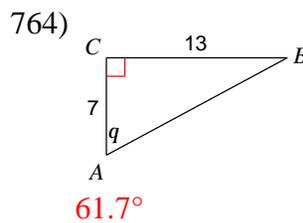
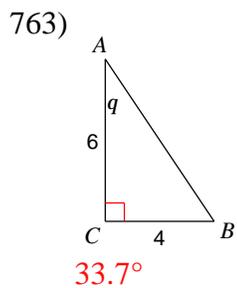
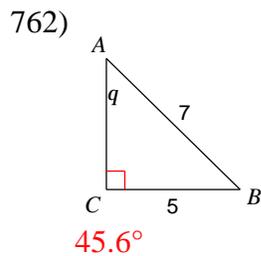
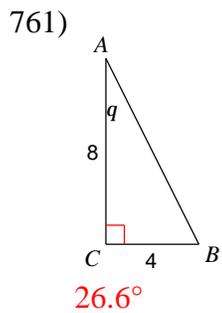
748) Find $\csc q$ if $\tan q = \frac{3}{4} \frac{5}{3}$

749) Find $\csc q$ if $\cos q = \frac{4}{5} \frac{5}{3}$

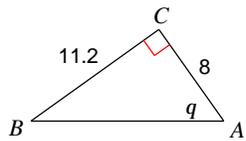
750) Find $\sin q$ if $\sec q = \frac{14\sqrt{3}}{9} \frac{13}{14}$

Find the measure of each angle indicated. Round to the nearest tenth.



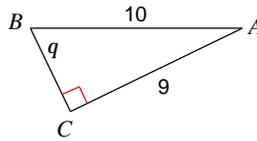


773)



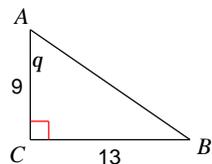
54.5°

774)



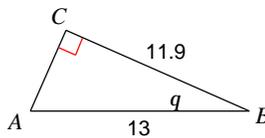
64.2°

775)



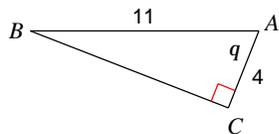
55.3°

776)



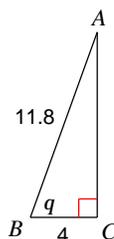
23.7°

777)



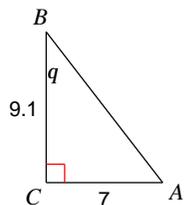
68.7°

778)



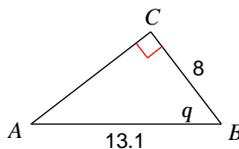
70.2°

779)



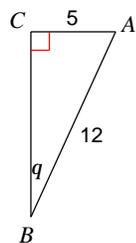
37.6°

780)



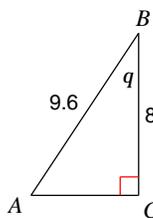
52.4°

781)



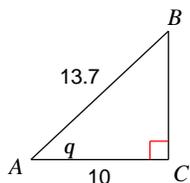
24.6°

782)



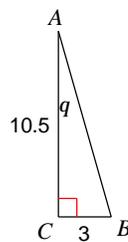
33.6°

783)



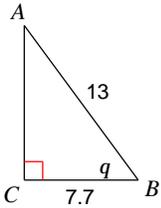
43.1°

784)



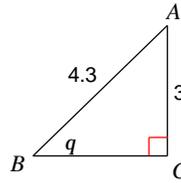
15.9°

785)



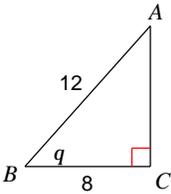
53.7°

786)



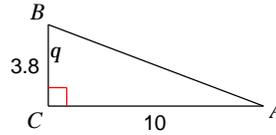
44.2°

787)



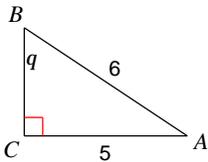
48.2°

788)



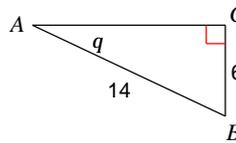
69.2°

789)



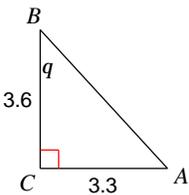
56.4°

790)



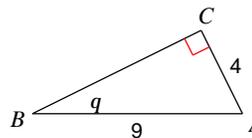
25.4°

791)



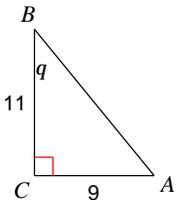
42.5°

792)



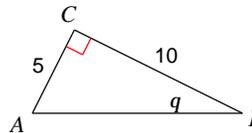
26.4°

793)



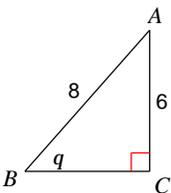
39.3°

794)



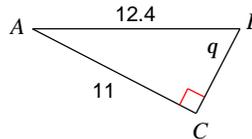
26.6°

795)



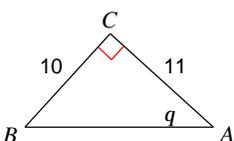
48.6°

796)



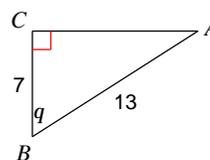
62.5°

797)



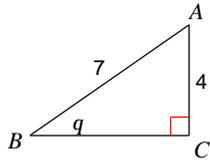
42.3°

798)



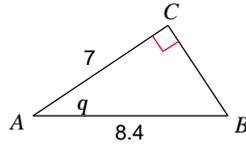
57.4°

799)



34.8°

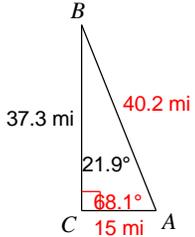
800)



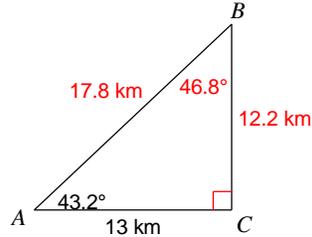
33.6°

Solve each triangle. Round answers to the nearest tenth.

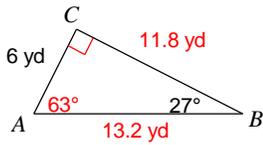
801)



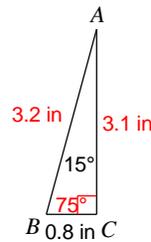
802)



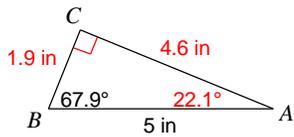
803)



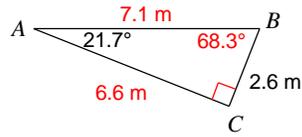
804)



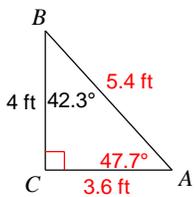
805)



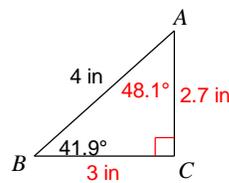
806)



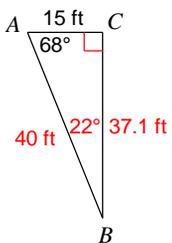
807)



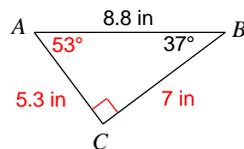
808)



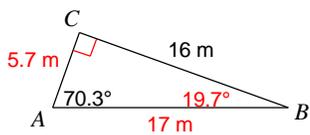
809)



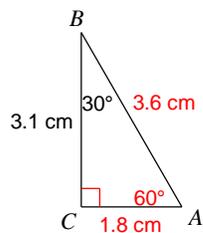
810)



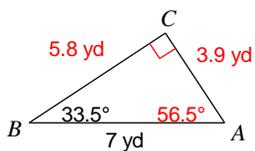
811)



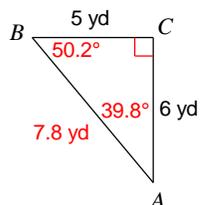
812)



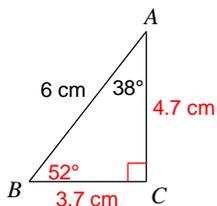
813)



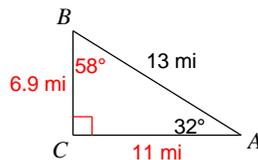
814)



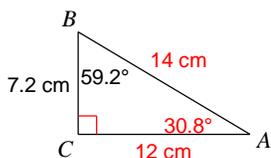
815)



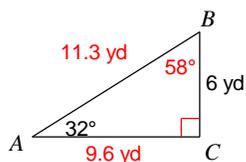
816)



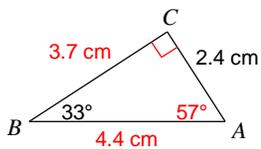
817)



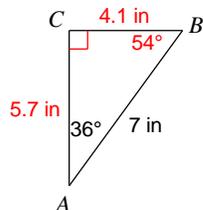
818)



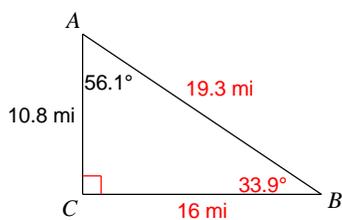
819)



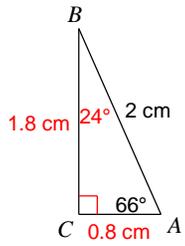
820)



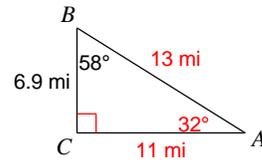
821)



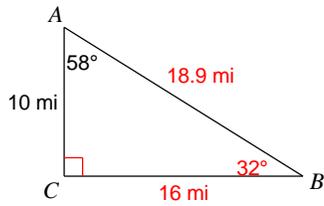
822)



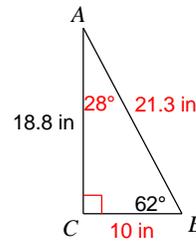
823)



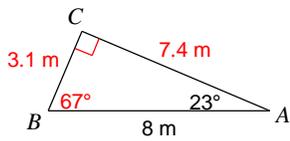
824)



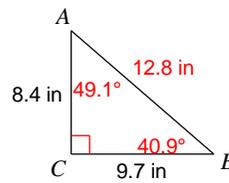
825)



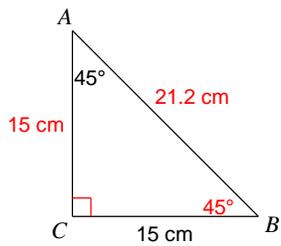
826)



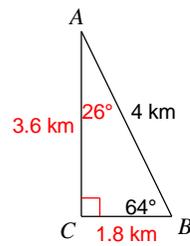
827)



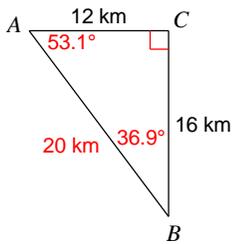
828)



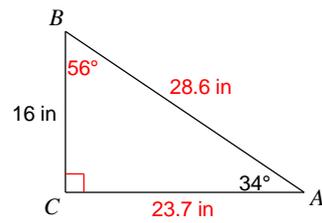
829)



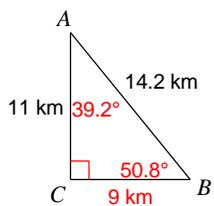
830)



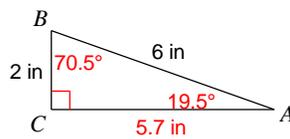
831)



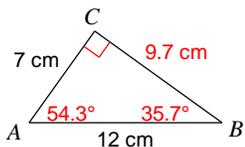
832)



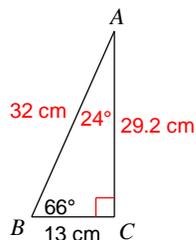
833)



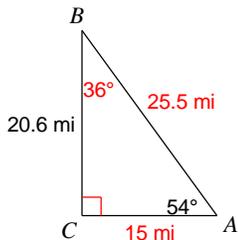
834)



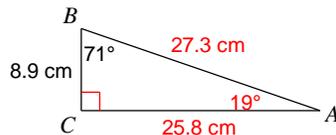
835)



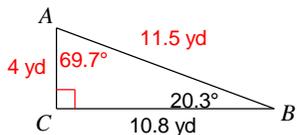
836)



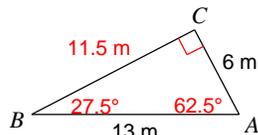
837)



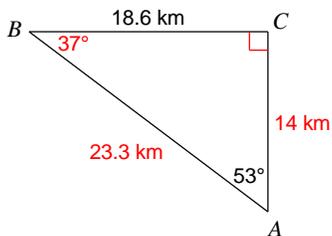
838)



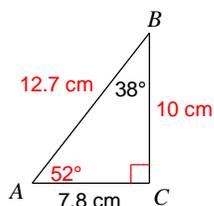
839)



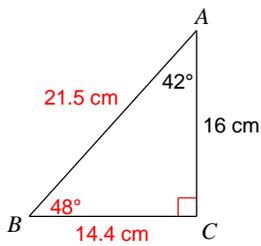
840)



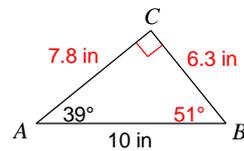
841)



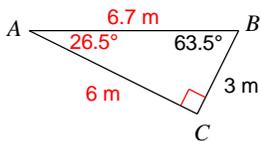
842)



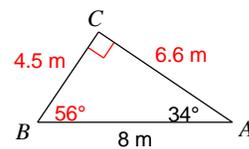
843)



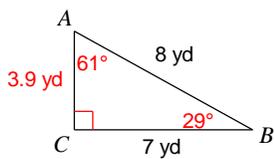
844)



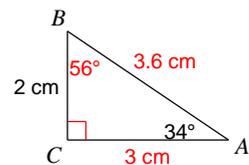
845)



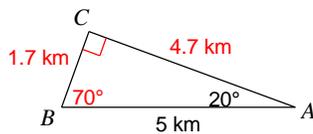
846)



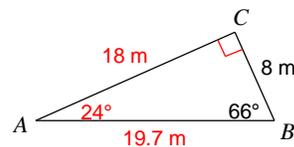
847)



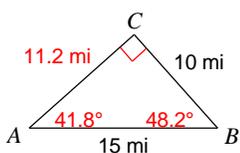
848)



849)



850)



In each problem, angle C is a right angle. Solve each triangle rounding answers to the nearest tenth.

851) $c = 4$ ft, $m\angle A = 44.5^\circ$

$m\angle B = 45.5^\circ$, $b = 2.9$ ft, $a = 2.8$ ft

852) $a = 14$ yd, $b = 11$ yd

$m\angle B = 38.2^\circ$, $m\angle A = 51.8^\circ$, $c = 17.8$ yd

853) $a = 10$ yd, $m\angle A = 24^\circ$

$m\angle B = 66^\circ$, $b = 22.5$ yd, $c = 24.6$ yd

854) $c = 13$ m, $m\angle B = 28^\circ$

$m\angle A = 62^\circ$, $a = 11.5$ m, $b = 6.1$ m

855) $m\angle B = 61^\circ$, $c = 3$ ft

$m\angle A = 29^\circ$, $b = 2.6$ ft, $a = 1.5$ ft

856) $m\angle A = 32^\circ$, $a = 7$ ft

$m\angle B = 58^\circ$, $b = 11.2$ ft, $c = 13.2$ ft

857) $a = 10.8$ cm, $m\angle A = 35^\circ$

$m\angle B = 55^\circ$, $b = 15.4$ cm, $c = 18.8$ cm

858) $m\angle B = 48^\circ$, $b = 2$ in

$m\angle A = 42^\circ$, $a = 1.8$ in, $c = 2.7$ in

- 859) $a = 13$ in, $m\angle B = 51^\circ$
 $m\angle A = 39^\circ$, $b = 16.1$ in, $c = 20.7$ in
- 861) $m\angle B = 39^\circ$, $b = 7.3$ mi
 $m\angle A = 51^\circ$, $a = 9$ mi, $c = 11.6$ mi
- 863) $b = 3.8$ cm, $m\angle A = 53^\circ$
 $m\angle B = 37^\circ$, $a = 5$ cm, $c = 6.3$ cm
- 865) $b = 14$ yd, $a = 5.2$ yd
 $m\angle A = 20.4^\circ$, $m\angle B = 69.6^\circ$, $c = 14.9$ yd
- 867) $m\angle B = 31^\circ$, $a = 20$ yd
 $m\angle A = 59^\circ$, $b = 12$ yd, $c = 23.3$ yd
- 869) $a = 5.8$ cm, $m\angle B = 25^\circ$
 $m\angle A = 65^\circ$, $b = 2.7$ cm, $c = 6.4$ cm
- 871) $c = 5$ in, $a = 4$ in
 $m\angle A = 53.1^\circ$, $m\angle B = 36.9^\circ$, $b = 3$ in
- 873) $m\angle B = 44^\circ$, $c = 16$ yd
 $m\angle A = 46^\circ$, $a = 11.5$ yd, $b = 11.1$ yd
- 875) $a = 8$ mi, $c = 11$ mi
 $m\angle A = 46.7^\circ$, $m\angle B = 43.3^\circ$, $b = 7.5$ mi
- 877) $a = 6.6$ mi, $m\angle B = 37^\circ$
 $m\angle A = 53^\circ$, $b = 5$ mi, $c = 8.3$ mi
- 879) $m\angle A = 70^\circ$, $c = 7.3$ km
 $m\angle B = 20^\circ$, $b = 2.5$ km, $a = 6.9$ km
- 881) $c = 9$ m, $m\angle B = 64^\circ$
 $m\angle A = 26^\circ$, $b = 8.1$ m, $a = 3.9$ m
- 883) $a = 2$ cm, $c = 4.8$ cm
 $m\angle A = 24.6^\circ$, $m\angle B = 65.4^\circ$, $b = 4.4$ cm
- 885) $b = 14$ km, $m\angle B = 24^\circ$
 $m\angle A = 66^\circ$, $a = 31.4$ km, $c = 34.4$ km
- 887) $m\angle B = 47^\circ$, $c = 8.9$ mi
 $m\angle A = 43^\circ$, $a = 6.1$ mi, $b = 6.5$ mi
- 889) $b = 7.6$ mi, $m\angle A = 64.7^\circ$
 $m\angle B = 25.3^\circ$, $a = 16$ mi, $c = 17.7$ mi
- 891) $b = 12.6$ ft, $a = 12$ ft
 $m\angle B = 46.4^\circ$, $m\angle A = 43.6^\circ$, $c = 17.4$ ft
- 893) $m\angle B = 49^\circ$, $c = 7.7$ m
 $m\angle A = 41^\circ$, $a = 5.1$ m, $b = 5.8$ m
- 895) $c = 15$ cm, $m\angle B = 33^\circ$
 $m\angle A = 57^\circ$, $b = 8.2$ cm, $a = 12.6$ cm
- 860) $m\angle A = 41^\circ$, $b = 5$ mi
 $m\angle B = 49^\circ$, $a = 4.3$ mi, $c = 6.6$ mi
- 862) $b = 10$ mi, $a = 3.7$ mi
 $m\angle B = 69.7^\circ$, $m\angle A = 20.3^\circ$, $c = 10.7$ mi
- 864) $a = 9.6$ yd, $m\angle B = 57^\circ$
 $m\angle A = 33^\circ$, $b = 14.8$ yd, $c = 17.6$ yd
- 866) $b = 9$ mi, $m\angle A = 47^\circ$
 $m\angle B = 43^\circ$, $a = 9.7$ mi, $c = 13.2$ mi
- 868) $c = 9$ m, $b = 8$ m
 $m\angle A = 27.3^\circ$, $m\angle B = 62.7^\circ$, $a = 4.1$ m
- 870) $m\angle B = 32^\circ$, $a = 14.4$ yd
 $m\angle A = 58^\circ$, $b = 9$ yd, $c = 17$ yd
- 872) $m\angle B = 48^\circ$, $c = 4.3$ cm
 $m\angle A = 42^\circ$, $b = 3.2$ cm, $a = 2.9$ cm
- 874) $m\angle B = 53^\circ$, $c = 3$ mi
 $m\angle A = 37^\circ$, $a = 1.8$ mi, $b = 2.4$ mi
- 876) $c = 7$ m, $m\angle A = 19^\circ$
 $m\angle B = 71^\circ$, $b = 6.6$ m, $a = 2.3$ m
- 878) $a = 11$ cm, $b = 6$ cm
 $m\angle B = 28.6^\circ$, $m\angle A = 61.4^\circ$, $c = 12.5$ cm
- 880) $c = 4$ mi, $m\angle B = 44^\circ$
 $m\angle A = 46^\circ$, $b = 2.8$ mi, $a = 2.9$ mi
- 882) $m\angle B = 66^\circ$, $a = 1.8$ cm
 $m\angle A = 24^\circ$, $b = 4$ cm, $c = 4.4$ cm
- 884) $a = 13$ mi, $b = 7$ mi
 $m\angle B = 28.3^\circ$, $m\angle A = 61.7^\circ$, $c = 14.8$ mi
- 886) $b = 6$ in, $m\angle B = 26^\circ$
 $m\angle A = 64^\circ$, $a = 12.3$ in, $c = 13.7$ in
- 888) $m\angle A = 44^\circ$, $a = 11.6$ m
 $m\angle B = 46^\circ$, $b = 12$ m, $c = 16.7$ m
- 890) $c = 15$ mi, $m\angle B = 68^\circ$
 $m\angle A = 22^\circ$, $a = 5.6$ mi, $b = 13.9$ mi
- 892) $m\angle B = 39^\circ$, $c = 16$ mi
 $m\angle A = 51^\circ$, $b = 10.1$ mi, $a = 12.4$ mi
- 894) $a = 11$ in, $b = 11.3$ in
 $m\angle B = 45.8^\circ$, $m\angle A = 44.2^\circ$, $c = 15.8$ in
- 896) $a = 16.9$ in, $m\angle B = 33^\circ$
 $m\angle A = 57^\circ$, $b = 11$ in, $c = 20.2$ in

897) $b = 14.4$ ft, $m\angle B = 64^\circ$

$m\angle A = 26^\circ$, $a = 7$ ft, $c = 16$ ft

899) $c = 3$ cm, $m\angle A = 31^\circ$

$m\angle B = 59^\circ$, $b = 2.6$ cm, $a = 1.5$ cm

898) $m\angle B = 17.2^\circ$, $a = 35.5$ yd

$m\angle A = 72.8^\circ$, $b = 11$ yd, $c = 37.2$ yd

900) $c = 9$ km, $a = 6$ km

$m\angle B = 48.2^\circ$, $m\angle A = 41.8^\circ$, $b = 6.7$ km