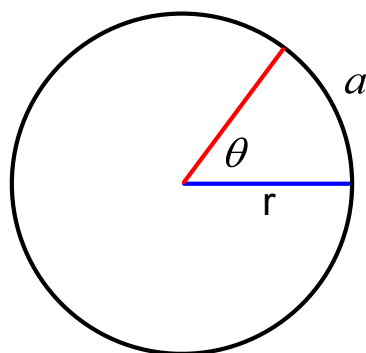


Oct 23-10:15 AM

Unit 4: Trigonometric Functions Oct 23/2014

Radian Measure



An angle measurement can be defined as the ratio of the arc length to the radius of a circle:

$$\theta = \frac{a}{r}$$

For a full circle, the arc length is the circumference:

$$C = 2\pi r$$

Therefore, the angle described by a full circle, 360° , is:

$$360^\circ = \frac{2\pi r}{r} = 2\pi$$

Oct 23-9:35 AM

Ex.1 Convert each of the following angles:

(a) 20° (b) 225° (c) $\frac{5\pi}{6}$

(d) 1.75 rad

$$2\pi = 360^\circ$$

$$\pi = 180^\circ$$

$$\frac{\pi}{180^\circ} = \frac{180^\circ}{\pi} = 1$$

$$(a) 20^\circ \times \frac{\pi}{180^\circ} = \frac{\pi}{9}$$

$$(b) \cancel{225}^\circ \times \frac{\pi}{\cancel{180}^\circ} = \frac{5\pi}{4}$$

$$(c) \frac{5\pi}{\cancel{6}} \times \frac{\cancel{180}^\circ}{\cancel{\pi}} = 150^\circ$$

$$(d) 1.75 \times \frac{180^\circ}{\pi} = \frac{315^\circ}{\pi} \approx 100.3^\circ$$

Oct 23-9:59 AM

Assigned Work:

p.320 # 1 - 4, 6 - (10, 15)

8h 9a

$$4(c). 3 \text{ radians} \times \frac{180^\circ}{\pi \text{ radians}}$$

$$= \frac{540^\circ}{\pi}$$

$$\approx 171.9^\circ$$

$$8(h) -\frac{9\pi}{\cancel{2}} \times \frac{\cancel{180}^\circ}{\cancel{\pi}}$$

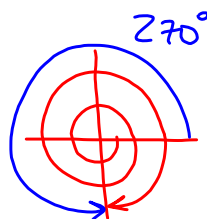
$$= -810^\circ$$

$$+360^\circ$$

$$+360^\circ$$

$$+360^\circ$$

$$\hline 270^\circ$$



Oct 15-8:11 PM

$$9(a) \quad \theta = \frac{19\pi}{20}$$

$$\theta = \frac{a}{r} \rightarrow r = 65 \text{ m}$$

$$\frac{19\pi}{20} = \frac{a}{65}$$

$$a = \frac{19\pi (65)}{20}$$

$$= \frac{247\pi}{4}$$

$$\approx 194.0$$

\therefore arc length is 194.0 m

Oct 24-9:14 AM

10. $\angle DCE = \frac{\pi}{12}$ $CE = 4.5 \text{ cm}$

$\pi - \frac{\pi}{2} - \frac{\pi}{6}$
 $= \frac{\pi}{2} - \frac{\pi}{6}$
 $= \frac{3\pi - \pi}{6}$
 $= \frac{2\pi}{6}$
 $= \frac{\pi}{3}$

$\pi - \frac{\pi}{2} - \frac{\pi}{12}$
 $= \frac{\pi}{2} - \frac{\pi}{12}$
 $= \frac{6\pi - \pi}{12}$
 $= \frac{5\pi}{12}$

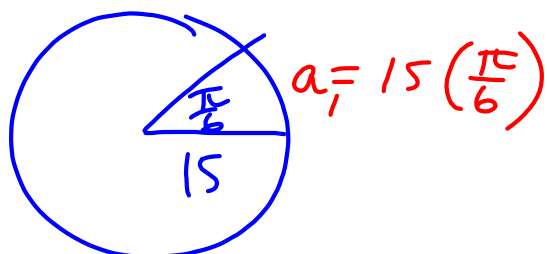
$\sin \theta = \frac{4}{8}$
 $\theta = \sin^{-1}\left(\frac{1}{2}\right)$
 $\theta = 30^\circ$
 $\theta = 30^\circ \times \frac{\pi}{180^\circ}$
 $\theta = \frac{\pi}{6}$

$\alpha + \frac{\pi}{12} = \frac{\pi}{3}$
 $\alpha = \frac{\pi}{3} - \frac{\pi}{12}$
 $= \frac{4\pi - \pi}{12}$
 $= \frac{3\pi}{12}$
 $= \frac{\pi}{4}$

$\cos \alpha = \frac{4.5}{x}$
 $x = \frac{4.5}{\cos \alpha}$
 $= \frac{4.5}{\cos\left(\frac{\pi}{4}\right)}$
 $= \frac{4.5}{\frac{1}{\sqrt{2}}}$
 $= 4.5\sqrt{2}$
 ≈ 6.4

Oct 24-9:21 AM

$$15. \quad \theta = \frac{a}{r} \Rightarrow a = r\theta$$



$$a_2 =$$

$$a_3 =$$

Oct 24-9:33 AM