

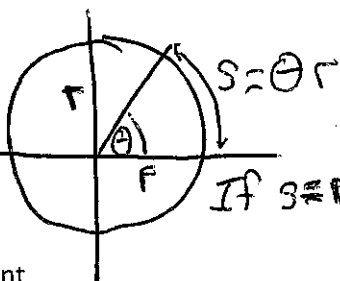
One radian is the measure of an angle θ whose terminal side intercepts an arc of length r

$$s = \theta r$$

Advanced Algebra

Chapter 10 Assignment #9

Radian and degree measurement



If $s = r$ then $\theta = 1$ radian

1) Convert to radians in terms of π

a) 90°

$$\frac{90}{180} \pi \quad \left(\frac{\pi}{2} \right)$$

b) 60°

$$\frac{60}{180} \pi \quad \left(\frac{\pi}{3} \right)$$

c) 30°

$$\frac{30}{180} \pi \quad \left(\frac{\pi}{6} \right)$$

d) 18°

$$\frac{18}{180} \pi \quad \left(\frac{\pi}{10} \right)$$

e) 9°

$$\frac{9}{180} \pi \quad \left(\frac{\pi}{20} \right)$$

f) 135°

$$\frac{135}{180} \pi \quad \left(\frac{3\pi}{4} \right)$$

g) 225°

$$\frac{225}{180} \pi \quad \left(\frac{5\pi}{4} \right)$$

h) 270°

$$\frac{270}{180} \pi \quad \left(\frac{3\pi}{2} \right)$$

i) 360°

$$\frac{360}{180} \pi \quad \left(2\pi \right)$$

j) 720°

$$\frac{720}{180} \pi \quad \left(4\pi \right)$$

k) 315°

$$\frac{315}{180} \pi \quad \left(\frac{7\pi}{4} \right)$$

l) 540°

$$\frac{540}{180} \pi \quad \left(3\pi \right)$$

m) 36°

$$\frac{36}{180} \pi \quad \left(\frac{\pi}{5} \right)$$

n) 80°

$$\frac{80}{180} \pi \quad \left(\frac{4\pi}{9} \right)$$

o) 230°

$$\frac{230}{180} \pi \quad \left(\frac{23\pi}{18} \right)$$

2) Convert the following to radians. Your answer should be correct to 3 significant figures.

a) 36.7°

$$\frac{36.7 \times \pi}{180} \quad \left(0.640 \right)$$

b) 137.2°

$$\frac{137.2 \times \pi}{180} \quad \left(2.39 \right)$$

c) 317.9°

$$\frac{317.9 \times \pi}{180} \quad \left(5.55 \right)$$

d) 219.6°

$$\frac{219.6 \times \pi}{180} \quad \left(3.83 \right)$$

e) 396.7°

$$\frac{396.7 \times \pi}{180} \quad \left(6.92 \text{ rad} \right)$$

3) Convert the following radian measure to degrees:

a) $\frac{\pi}{5}$

$$\frac{\pi}{5} \times \frac{180}{\pi} \quad \left(36^\circ \right)$$

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

$$\frac{3\pi}{5} \times \frac{180}{\pi} \quad \left(108^\circ \right)$$

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

$$\frac{3\pi}{4} \times \frac{180}{\pi} \quad \left(135^\circ \right)$$

d) $\frac{\pi}{18}$

$$\frac{\pi}{18} \times \frac{180}{\pi} \quad \left(10^\circ \right)$$

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

$$\frac{\pi}{9} \times \frac{180}{\pi} \quad \left(20^\circ \right)$$

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

$$\frac{7\pi}{9} \times \frac{180}{\pi} \quad \left(140^\circ \right)$$

g) $\frac{\pi}{10}$

$$\frac{\pi}{10} \times \frac{180}{\pi} \quad \left(18^\circ \right)$$

h) $\frac{3\pi}{20}$

$$\frac{3\pi}{20} \times \frac{180}{\pi} \quad \left(27^\circ \right)$$

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

$$\frac{5\pi}{6} \times \frac{180}{\pi} \quad \left(300^\circ \right)$$

j) $\frac{\pi}{8}$

$$\frac{\pi}{8} \times \frac{180}{\pi} \quad \left(22.5^\circ \right)$$

Find the intercepted arc length for each central angle given in degrees

24π

1) $\theta = 30^\circ$ and the $r=12$

$$2\pi r$$

$$\frac{1}{2} \times \frac{360}{360}$$

$$s = \theta r \quad \frac{24\pi}{12}$$

$$s = 30(12) \quad \left(2\pi \right)$$

2) $\theta = 45^\circ$ and the $r=8$

$$2\pi r \quad 16\pi \left(\frac{45}{360} \right) \quad \left(2\pi \right)$$

3) $\theta = 210^\circ$ and the $D=8$

$$s = 360$$

$$\frac{210}{360}$$

$$2\pi r$$

$$16\pi \left(\frac{210}{360} \right)$$

$$76\pi \cdot \frac{7}{12} \quad \left(\frac{28\pi}{3} \right)$$

4) $\theta = 330^\circ$ and the $D=10$

$$\frac{330}{360}$$

$$\frac{11}{12} \quad 20\pi$$

$$20\pi \cdot \frac{11}{12}$$

$$\left(57.6 \right)$$

$$\frac{10}{2} \cdot \frac{5}{3} \cdot \frac{55\pi}{3}$$