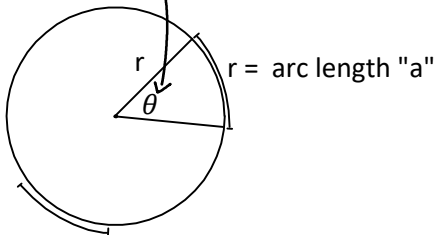


C12 - 4.1 - Degree/Radian Notes

"One radian is equal to the length of the arc of a circle with radius = 1.

1 Radian is the central angle whose arc is equal to the radius

$$1 \text{ rad} = 57.3^\circ$$



$$1 \text{ rad} = 57.3^\circ$$

$$1 \text{ inch} = 2.54 \text{ cm}$$

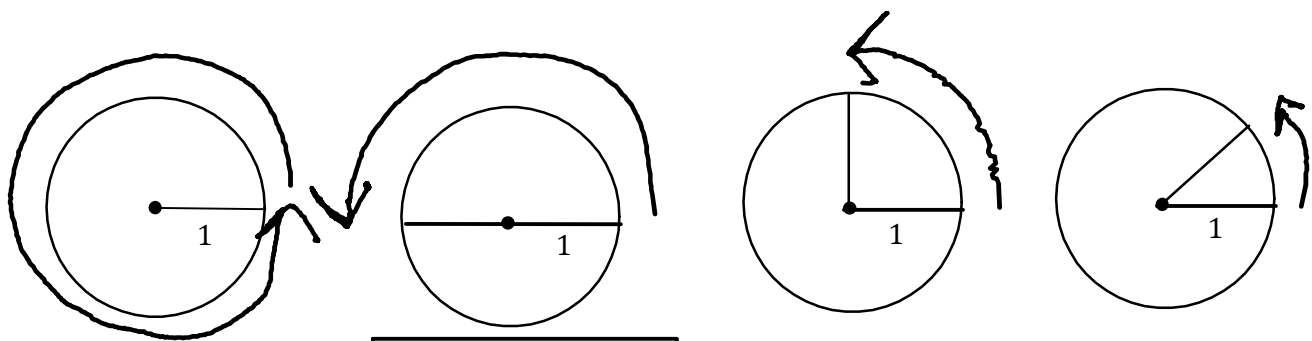
$$\theta_{\text{rad}} = \frac{a}{r}$$

$$\theta_{\text{rad}} = \frac{r}{r}$$

$$\theta_{\text{rad}} = 1 \text{ rad}$$

One Radian equals 57.3°

Arc length



$$\theta = 360^\circ = 2\pi_{\text{rad}}$$

$$C = 2\pi r$$

$$C = 2\pi(1)$$

$$C = 2\pi$$

$$C = 6.28$$

$$\theta = 180^\circ = \pi_{\text{rad}}$$

$$C = 2\pi r$$

$$C = 2\pi(1)$$

$$C = 2\pi$$

$$\frac{C}{2} = \frac{2\pi}{2}$$

$$C = \pi$$

$$\theta = 90^\circ = \frac{\pi}{2}_{\text{rad}}$$

$$C = 2\pi r$$

$$C = 2\pi(1)$$

$$C = 2\pi$$

$$\frac{C}{4} = \frac{2\pi}{4}$$

$$C = \frac{\pi}{2}$$

$$\theta = 45^\circ = \frac{\pi}{4}_{\text{rad}}$$

$$C = 2\pi r$$

$$C = 2\pi(1)$$

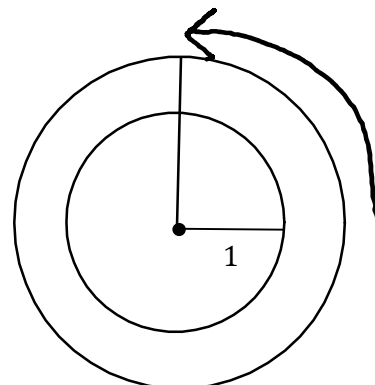
$$C = 2\pi$$

$$\frac{C}{8} = \frac{2\pi}{8}$$

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

Notice the size of the circle does not matter.

$$90^\circ = \frac{\pi}{2}$$



$$\theta = 90^\circ = \frac{\pi}{2}_{\text{rad}}$$

C12 - 4.1 - Degree/Radian Conversion Notes

Degrees to Radians:

Radians to Degrees:

$$\frac{180^\circ}{\pi_{rad}}$$

$$\frac{\pi_{rad}}{180^\circ}$$

$$\times \frac{\pi}{180^\circ}$$

$$\times \frac{180^\circ}{\pi}$$

π and 180° are the same thing, just in different units

Find θ in radians

$$30^\circ =? \quad 30^\circ \times \frac{\pi}{180^\circ} = \frac{30\pi}{180} = \frac{\pi}{6} = 0.52$$

$$120^\circ =? \quad 120^\circ \times \frac{\pi}{180^\circ} = \frac{120\pi}{180} = \frac{2\pi}{3}$$

$$99^\circ =? \quad 99^\circ \times \frac{\pi}{180^\circ} = \frac{99\pi}{180} = \frac{11\pi}{20}$$

Find θ in degrees

$$\frac{\pi}{3_{rad}} =? \quad \frac{\pi}{3_{rad}} \times \frac{180^\circ}{\pi} = \frac{180\pi}{3\pi} = 60^\circ$$

$$\frac{2\pi}{5_{rad}} =? \quad \frac{2\pi}{5_{rad}} \times \frac{180^\circ}{\pi} = \frac{360\pi}{5\pi} = 72^\circ$$

$$1.57_{rad} =? \quad 1.57_{rad} \times \frac{180^\circ}{\pi} = 90^\circ$$

$$3 =? \quad 3_{rad} \times \frac{180^\circ}{\pi} = \frac{540}{\pi} = 171.89^\circ$$

Degrees	Radians	Radians	Radians
0°	0_{rad}	0_{rad}	0_{rad}
15°	$\frac{\pi}{12_{rad}}$	$\frac{\pi}{12_{rad}}$	0.26_{rad}
30°	$\frac{2\pi}{12_{rad}}$	$\frac{\pi}{6_{rad}}$	0.52_{rad}
45°	$\frac{3\pi}{12_{rad}}$	$\frac{\pi}{4_{rad}}$	0.79_{rad}
60°	$\frac{4\pi}{12_{rad}}$	$\frac{\pi}{3_{rad}}$	1.05_{rad}
75°	$\frac{5\pi}{12_{rad}}$	$\frac{5\pi}{12_{rad}}$	1.31_{rad}
90°	$\frac{6\pi}{12_{rad}}$	$\frac{\pi}{2_{rad}}$	1.57_{rad}
180°	$\frac{12\pi}{12} = \pi_{rad}$	π_{rad}	3.14_{rad}
270°	$\frac{3\pi}{2_{rad}}$	$\frac{3\pi}{2_{rad}}$	4.71_{rad}
360°	$2\pi_{rad}$	$2\pi_{rad}$	6.28_{rad}
720°	$4\pi_{rad}$	$4\pi_{rad}$	12.56_{rad}

If there are no units it is in radians.

C12 - 4.1 - $\frac{\# \pi}{\#}$ Notes

