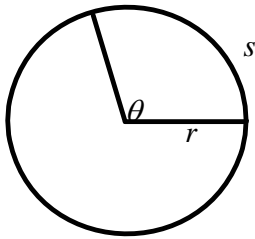


Arc Length, Area of a Sector, Linear Speed and Angular Speed

Arc Length



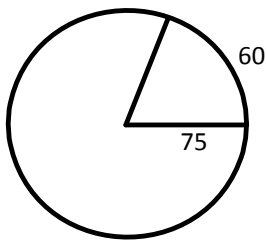
$$s = r\theta$$

s : arc length

r : radius

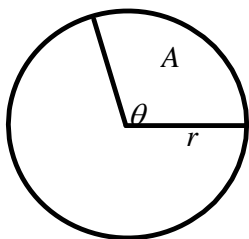
θ : central angle measured in radians

1. Find the measure of the angle in radians.



2. Find the length of the arc on a circle with a radius of 5 meters intercepted by a central angle of $\frac{4\pi}{3}$ radians.

Area of a Sector



$$A = \frac{1}{2} \theta r^2$$

A : area of the sector

r : radius

θ : central angle measured in radians

3. Find the area of the sector of a circle with a central angle of 3.4 radians and a radius of 5.2 inches.

4. A sprinkler can water a lawn up to a distance of 50 feet. It turns through an angle of 120° . Find the area of the lawn that can be watered by the sprinkler.

Linear Speed - Measures how fast a particle is moving at a constant speed along a circular arc.

$$\text{Linear Speed} = \frac{r\theta}{t}$$

r : radius

θ : central angle in radians

t : time

5. The second hand of a clock is 5.6 inches long. Find the linear speed of the tip of the second hand.

6. A helicopter blade is 3 meters long and rotates at 430 revolutions per minute. What is the linear velocity of the tip of the blade?

Angular Speed - Measures how fast the central angle is changing as a particle is moving at a constant speed along a circular arc.

$$\text{Angular Speed} = \frac{\theta}{t} \text{ or } \frac{s}{rt}$$

s : arc length

r : radius

θ : central angle in radians

t : time

7. Through what angle does the drive shaft of a car rotate in one second when the tachometer reads 2,500 revolutions per minute?

8. A car is moving at a rate of 55 miles per hour and the diameter of each wheel is 2.42 feet.

a) What is the rotational speed of the wheels in revolutions per minute?

b) What is the angular speed of the wheels in radians per minute?