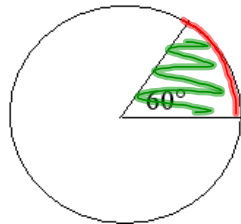
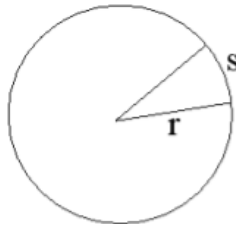


Section 7.2 Notes

Sector of a Circle: Region bounded by a central angle and the intercepted arc

s = arc length
 r = radius
 $C = 2\pi r$
 Area = $2\pi r^2$



$\frac{60}{360} = \frac{1}{6}$ of the circle
 so the arc length = $\frac{1}{6}C$
 and the area of the sector = $\frac{1}{6}A$

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Arc Length

Area

θ is in degrees

$$s = \frac{\theta}{360} 2\pi r$$

$$k = \frac{\theta}{360} \pi r^2$$

θ is in radians

$$s = r\theta$$

$$k = \frac{\theta}{2\pi} \cancel{\pi} r^2 = \frac{\theta}{2} r^2$$

$$S = \frac{\theta}{2\pi} \cdot 2\pi r$$

$$k = \frac{1}{2} \theta r^2 \quad \frac{1}{2} \theta \cdot r \cdot r$$

$$S = r\theta$$

$$k = \frac{1}{2} rs$$

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Example 1

A sector has a radius of 5 cm and a central angle of .7 radians.
Find its arc length and area.

$$S = r\theta$$

$$S = 5(.7)$$

$$S = 3.5 \text{ cm}$$

$$K = \frac{1}{2}\theta r^2 \text{ OR } K = \frac{1}{2}rs$$

$$\frac{1}{2}(.7)(5)^2 = \frac{1}{2}(5)(3.5)$$

$$K = 8.75 \text{ cm}^2$$

Example 2

The arc length of a sector is 6 cm and the area is 75 cm².
What is the radius and central angle?

$$K = \frac{1}{2}rs$$

$$75 = \frac{1}{2}r \cdot 6$$

$$75 = 3r$$

$$r = 25 \text{ cm}$$

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

$$75 = \frac{1}{2}\theta 25^2$$

$$75 = 312.5\theta$$

$$S = r\theta$$

$$6 = 25\theta$$

$$\frac{6}{25} = \frac{25\theta}{25}$$

$$\theta = .24$$

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Example 3

The central angle is 25° and the arc length is 2.6 cm. What is the area?

$$K = \frac{\theta}{360} \pi r^2$$

$$K = \frac{25}{360} \pi (5.96)^2$$

$$K = 7.75 \text{ cm}^2$$

$$S = \frac{\theta}{360} 2\pi r$$

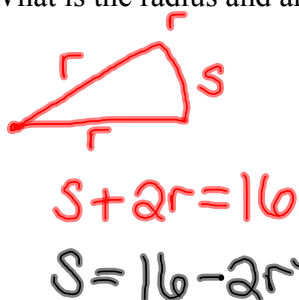
$$2.6 = \frac{25}{360} \cdot 2\pi r$$

$$2.6 = .436r$$

$$r = 5.96$$

Example 4

A sector has a perimeter of 16 cm and area of 15 cm².
What is the radius and arc length?



$$K = \frac{1}{2}rs$$

$$K = \frac{1}{2}r(16 - 2r)$$

$$15 = 8r - r^2$$

$$r^2 - 8r + 15 = 0$$

$$(r - 5)(r - 3) = 0$$

$$r = 5 \text{ or } 3$$

If $r = 5 \text{ cm}$

$$S = 16 - 2(5)$$

$$S = 6 \text{ cm}$$

If $r = 3 \text{ cm}$

$$S = 16 - 2(3)$$

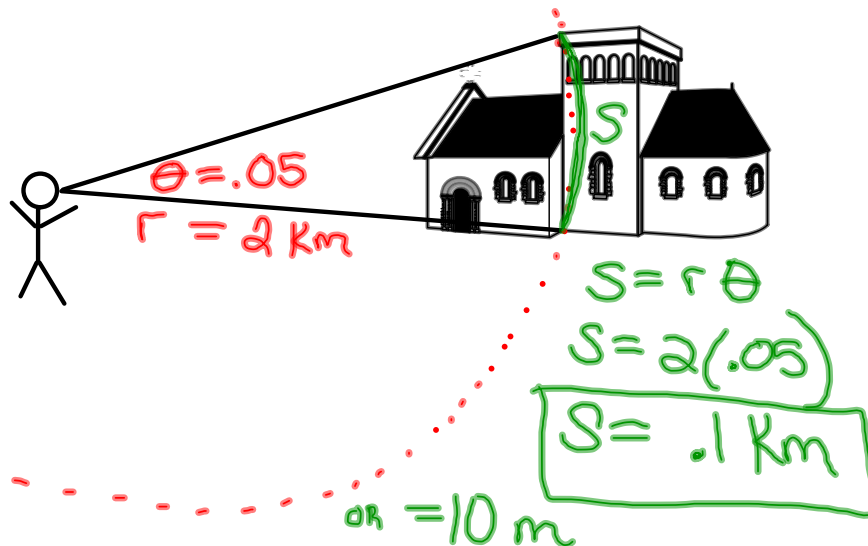
$$S = 10 \text{ cm}$$

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APPARENT SIZE: the measure of an angle

Example 5

The apparent size of a building 2km away is .05 radians.
What is its approximate height?



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Homework

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