

**Exercise 1**

On a circle of radius 10 m, how long is an arc that subtends a central angle of (a)  $4\pi/5$  radians?  
(b)  $110^\circ$ ?

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**Solution**

The formula relating arc length, central angle, and radius is

$$s = r\theta,$$

where  $\theta$  is in radians.

**Part (a)**

If  $r = 10$  m and  $\theta = 4\pi/5$ , then

$$s = 10 \left( \frac{4\pi}{5} \right) = 8\pi \text{ m} \approx 25.1 \text{ m}.$$

**Part (b)**

If  $r = 10$  m and  $\theta = 110^\circ = 110^\circ \times \frac{\pi}{180^\circ} = \frac{11}{18}\pi$ , then

$$s = 10 \left( \frac{11\pi}{18} \right) = \frac{55}{9}\pi \text{ m} \approx 19.2 \text{ m}.$$