

Arc length

Theorem

If 2 central angles in different circles are equal, the ratio of the lengths of their arcs equals the ratio of their radii.

$$\text{Using a unit circle: } \frac{a}{\alpha} = \frac{r}{1} \text{ or } a = r \alpha$$

The length of any circular arc equals the product of the radius and the radian measure of the central angle it subtends.

Example

Find the length of an arc that subtends a central angle of 32° in a circle with radius 11 inches.

$$\text{Arc length} = r \alpha$$

$$32^\circ \approx .588 \text{ radians}$$

$$\approx 11(.588) \approx 6.14 \text{ inches}$$