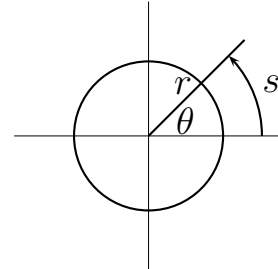


MATH 109 – TOPIC 4
ARC LENGTH AND RADIAN MEASURE

Consider a circle of radius r centered at the origin. Then the angle θ , measured in radians, subtends (or “marks off”) an arc of length s on the circle. For one complete revolution, which is 2π radians, the corresponding arc length is the circumference of the circle, $2\pi r$. Using proportions, we have



$$\frac{\text{angle}}{\text{arc length}} = \frac{\text{one revolution}}{\text{circumference}},$$

or

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

or

$$s = r\theta, \text{ where } \theta \text{ is in radians.}$$

The importance of this formula will be seen in [Topic 5](#).

PRACTICE PROBLEMS for Topic 4 – Arc Length and Radian Measure

4.1 If $\theta = \frac{\pi}{2}$ and $r = 2$, how long is the arc length subtended? [Answer](#)

4.2 On a circle whose radius is 3, what angle subtends an arc of length 4?

[Answer](#)

ANSWERS to PRACTICE PROBLEMS (Topic 4 – Arc Length and Radian Measure)

4.1 π units

4.2 $\frac{4}{3}$ radians

[Return to Problem](#)