Arc Length from Radians

When angles are measured in radians, the arc length formula becomes much simpler.

Formula:
Arc Length = $r \times \theta$

Where r is the radius and θ is the angle in radians.

Why this works:
Radians are defined based on the radius of a circle, so the fraction of the circle is already built into the angle measure.

Example:
If $r = 6$ and $\theta = \pi/3$,
Arc Length = $6 \times \pi/3 = 2\pi$

Quiz

1. What is the arc length formula when angles are in radians?
2. What units must the angle be in to use this formula?
3. Find the arc length when $r = 4$ and $\theta = \pi/2$.
4. True or False: The radian arc length formula includes π automatically.
5. Why is the radian formula simpler than the degree formula?

Answer Key

1. Arc Length = $r \times \theta$
2. Radians
3. Arc Length = $4 \times \pi/2 = 2\pi$
4. True
5. Because radians are based on the radius of the circle.