

Arc Length, Sector Area, and Radians

In Geometry, you learned how to find arc lengths and sector areas using your knowledge of the circumference and area of circles and an angle measurement given to you in degrees. Today you will see how the use of radians as the unit of measurement for angles can simplify those formulas.

NOTE: Angles will be represented with the variable θ , which is the Greek letter theta. This is a common variable used for angles in mathematics, so I would like you to get used to seeing and using it.

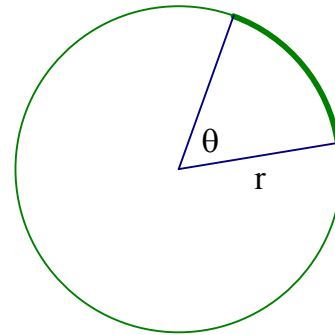
Arc Length

The length of an arc on a circle is given by the formula $L = \frac{\theta}{360} \times 2\pi r$.

1) What does the formula $2\pi r$ give the measurement of?

2) Why do we multiply it by $\frac{\theta}{360}$ to find the measurement of the arc?

3) In the formula, substitute the number related to degrees with the corresponding amount for radians. Then simplify the formula.



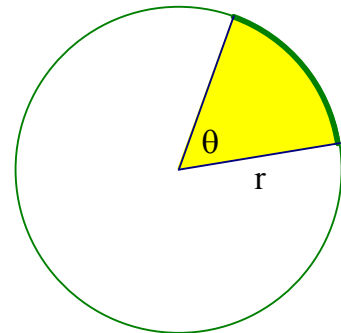
Sector Area

The area of a sector (pie slice) in a circle is given by the formula $A = \frac{\theta}{360} \times \pi r^2$.

1) What does the formula πr^2 give the measurement of?

2) Why do we multiply it by $\frac{\theta}{360}$ to find the area of just the shaded portion?

3) In the formula, substitute the number related to degrees with the corresponding amount for radians. Then simplify the formula.



As you can see, using radians gives us MUCH smaller formulas to calculate with!