Precalc Honor
Winkler

7-2 Arc Length and Sector Area

Name:__________

Think: $\frac{portion\ of\ circle}{whole\ circle}$… $\frac{measure\ of\ central\ angle}{360^o} = \frac{arc\ length}{circumference} = \frac{area\ of\ sector}{area\ of\ circle}$.

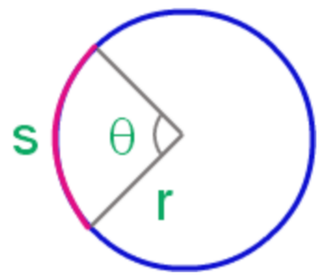
Rearrange this proportion to get the formula.

$S = \frac{\theta}{360^o} \cdot 2\pi r$ (degrees)

$S = \frac{\theta}{2\pi} \cdot 2\pi r$

↓

$S = r\theta$ (radians)

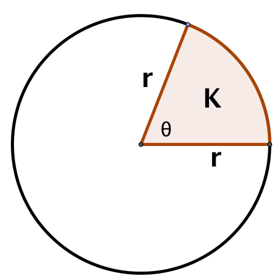



$K = \frac{\theta}{360^o} \cdot \pi r^2$ (degrees)

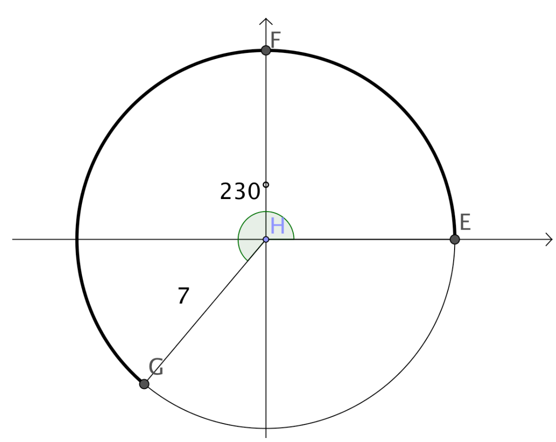
$K = \frac{\theta}{2\pi} \cdot \pi r^2$

↓

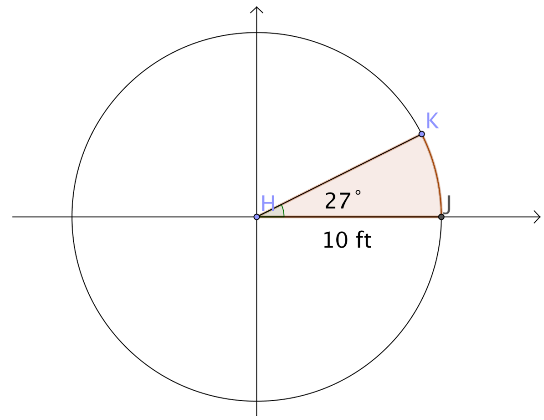
$K = \frac{1}{2} r^2 \theta$



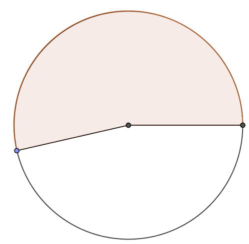

1. Find the arc length of $\overset{\frown}{EFG}$. (Don't use $S = r\theta$ if the angle is in degrees…)

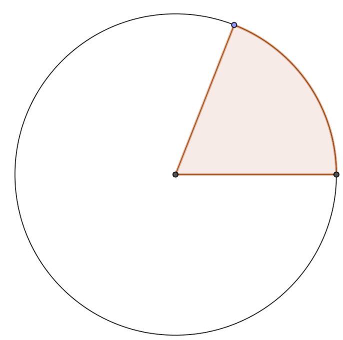


2. Find the area of a 27° sector of a circle with a radius of 10 ft.




3. A sector has perimeter 16 cm and area 15 $cm^2$. Find its radius r and arc length s. Create two equations, then solve using substitution.





**Apparent size** is useful for estimating the size of the moon and planets because the apparent size of the objects is universal for everyone on earth—everyone measures the same angle, which allows astronomers to share their observations and measurements.

4. Given $\theta = .01^{\circ}$ and $r = 8\times10^{8}$ km, find d (approximated by S).