# Central Angle, Arc, and Sector Problems on Standardized Tests

Arcs and sectors are proportional to the central angle of a circle. A proportion involves any two of the following fractions of "part over whole."

$$\frac{\text{Part}}{\text{Whole}} = \frac{\text{Partial Percentage}}{100\%} = \frac{\text{Central Angle}}{360°} = \frac{\text{Arc Length}}{\text{Circumference}} = \frac{\text{Sector Area}}{\text{Area}}$$

Remember that for circles:

Circumference: $C = \pi d$

Area: $A = \pi r^2$

$d = 2r$ and $r = \frac{d}{2}$

**Practice!**

1. In circle $O$, points $A$ and $B$ lie on its circumference. Circle $O$ has an area of $100\pi$. $\angle AOB$ is 90°. What is the area of sector $AOB$?

2. In circle $O$, points $A$ and $B$ lie on its circumference. $\angle AOB$ is 72° and $AO$ is 12 units long. How many units long is minor arc $AB$?

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3. In circle $O$, points $A$ and $B$ lie on its circumference. $\angle AOB$ is 45°. The shaded region of sector $AOB$ has an area of $25\pi$. What is the circumference of the circle?

4. In circle $O$, points $A$ and $B$ lie on its circumference. Circle $O$ has a circumference of $12\pi$ and the shaded region of sector $AOB$ is $3\pi$. What is the measure of $\angle AOB$ in degrees?

5. Janie took a poll at her school, asking students for their favorite ice cream flavor. 28% chose chocolate, 24% chose vanilla, 14.5% chose chocolate chip, 12.5% chose strawberry, 7% chose peanut butter, and the rest chose “Other.” When Janie makes a pie graph of this information, the central angle for “Other” would measure how many degrees?

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Answer Key

1. $25\pi$
2. $4.8\pi$
3. $20\sqrt{2}\pi$
4. $30°$
5. $50.4°$

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