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Mr. Schlansky

Date _____
Geometry

Handwritten formulas at top:
$A = \pi r^2$ $C = \pi d$

degrees:
$A = \frac{\theta}{360} \pi r^2$

degrees:
$C = \frac{\theta}{360} \pi d$

radians:
$A = \frac{\theta}{2\pi} \pi r^2$

radians:
$C = \frac{\theta}{2\pi} \pi d$

Conversions with Arc Length and Area of a Sector

1. Find the arc length of a sector that has a diameter of 10 inches and a central angle of $\frac{\pi}{3}$ radians in terms of π.

$$C = \frac{\theta}{2\pi} \pi d$$
$$C = \frac{\frac{\pi}{3}(10)^5}{\cancel{2}}$$
$$C = \frac{5\pi}{3}$$

2. Find the arc length of a sector that has a radius of 4 inches and has a central angle of 45° to the nearest tenth of an inch.

$$C = \frac{\theta}{360} \pi d$$
$$C = \frac{45\pi(8)}{360}$$
$$C = 3.1$$

3. Find the area of a sector whose radius is 7 centimeters and central angle is 40° to the nearest hundredth of a square centimeter.

$$A = \frac{\theta}{360} \pi r^2$$
$$A = \frac{40}{360} \pi (7)^2$$
$$A = 17.10$$

4. Find the area of a sector whose diameter is 20 centimeters and central angle is $\frac{2\pi}{3}$ radians to the nearest square centimeter.

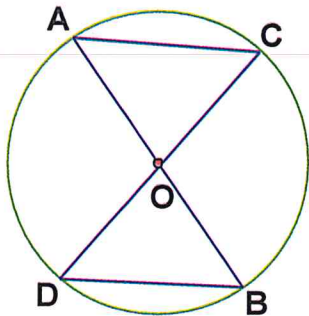$$A = \frac{\theta}{2\pi} \pi r^2$$
$$A = \frac{\frac{2\pi}{3}(10)^2}{2}$$

$$A = \frac{\frac{2\pi}{3}(100)^{50}}{2}$$
$$A = \frac{100\pi}{3}$$
$$A = 104.72$$

5. If arc $AC = 8$, and $\overline{AB} = 10$, find $m\angle AOC$ to the *nearest hundredth of a degree*.

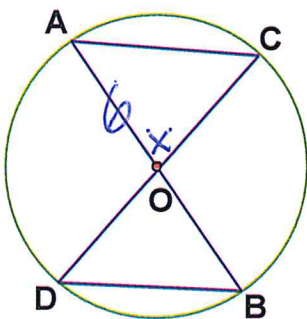$$C = \frac{\theta}{360}\pi d$$

$$360\left(8\right) = \left(\frac{X}{360}\pi(10)\right)360$$

$$\frac{2880}{10\pi} = \frac{10\pi X}{10\pi}$$

$$91.67 = X$$

6. If the area of sector AOC is 12π and $\overline{AO} = 6$, find $m\angle AOC$ to the *nearest radian*.

$$A = \frac{\theta}{2\pi}\pi r^2$$

$$12\pi = \frac{X(6)^2}{2}$$

$$2\left(12\pi\right) = \left(\frac{36X}{2}\right)2$$

$$\frac{24\pi}{36} = \frac{36x}{36}$$

$$2 = X$$

7. In a circle with a diameter of 32, the area of a sector is $\frac{512\pi}{3}$. The measure of the angle of the sector, in radians, is

1) $\frac{\pi}{3}$

(2) $\frac{4\pi}{3}$

3) $\frac{16\pi}{3}$

4) $\frac{64\pi}{3}$

$$A = \frac{\theta}{2\pi}\pi r^2$$

$$\frac{512\pi}{3} = \frac{X(16)^2}{2}$$

$$\frac{1024\pi}{768} = \frac{768x}{768}$$

$$\frac{4}{3}\pi$$

8. The diagram below shows circle O with radii $\overline{OA}$ and $\overline{OB}$. The measure of angle AOB is $120°$, and the length of a radius is 6 inches.
Which expression represents the length of arc AB, in inches?

1) $\frac{120}{360}(6\pi)$

2) $120(6)$

3) $\frac{1}{3}(36\pi)$

(4) $\frac{1}{3}(12\pi)$

$$C = \frac{\theta}{360}\pi d$$

$$C = \frac{120}{360}\pi(12)$$

$$C = \frac{1}{3}(12\pi)$$