$A = \dfrac{\theta \pi r^2}{360}$ A = area of sector
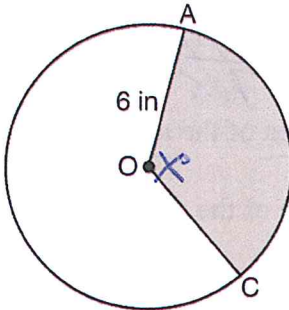θ = central angle (in degrees)
r = radius

Name **Schlansky**   Date _____
Mr. Schlansky   Geometry

Given Area of a Sector

1. In the diagram below of circle O, the area of the shaded sector AOC is 12π in^2 and the length of $\overline{OA}$ is 6 inches. Determine and state m$\angle AOC$.
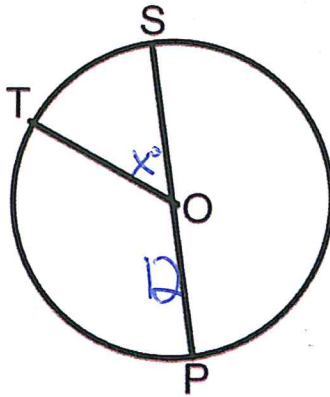

$A = \dfrac{\theta \pi r^2}{360}$

$12\pi = \dfrac{x \pi (6)^2}{360}$

$\dfrac{360x}{36} = \dfrac{4320}{36}$

$X = 120°$

2. In the diagram below of circle O, the area of sector STO is 48π in^2 and the length of $\overline{OP}$ is 12 inches. Determine and state $m\angle SOT$
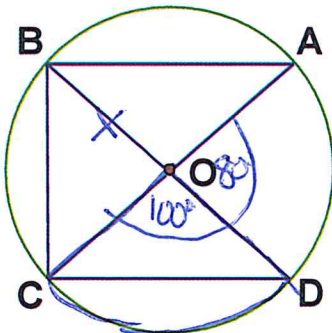

$A = \dfrac{\theta \pi r^2}{360}$

$48\pi = \dfrac{x \pi (12)^2}{360}$

$\dfrac{144x}{144} = \dfrac{17280}{144}$

$X = 120°$

3. In circle O, diameters $\overline{BOD}$ and $\overline{COA}$ intersect at the center of the circle O. If the area of sector OCD = 240π square inches and $m\angle AOD = 80$, find the measure of $\overline{OB}$ to the nearest tenth of an inch.

$A = \dfrac{\theta \pi r^2}{360}$

$240\pi = \dfrac{100\pi x^2}{360}$

$\dfrac{100x^2}{100} = \dfrac{86400}{100}$

$\sqrt{x^2} = \sqrt{864}$

$x = 29.4$

4. 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) $\frac{4\pi}{3}$
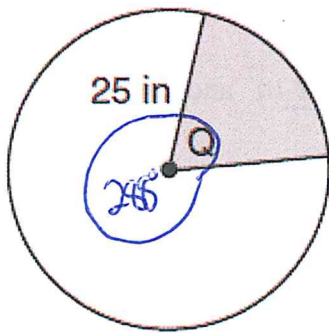
3) $\frac{16\pi}{3}$

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

(handwritten work)

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

$\dfrac{4\pi}{3} = X$

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

$1024\pi = 768 X$ over 768

5. In the diagram below, the circle has a radius of 25 inches. The area of the *unshaded* sector is 500π in².

Determine and state the degree measure of angle Q, the central angle of the shaded sector.

25 in

(handwritten work)

unshaded Sector

$A = \dfrac{\theta \pi r^2}{360}$

$\dfrac{500\pi}{1} = \dfrac{X \pi (25)^2}{360}$

$\dfrac{625 X}{625} = \dfrac{180000}{625}$

$X = 288$

$360 - 288 = 72°$

6. In the diagram below of circle O, the area of the shaded sector LOM is 2π cm².
If the length of $\overline{NL}$ is 6 cm, what is m$\angle N$?

(handwritten work)
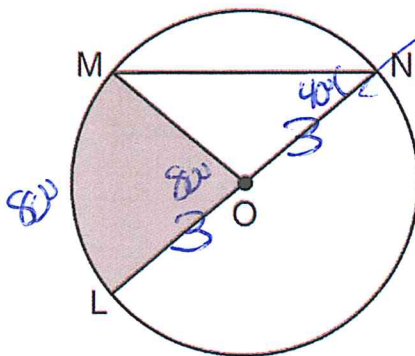
$A = \dfrac{\theta \pi r^2}{360}$

$\dfrac{2\pi}{1} = \dfrac{X \pi (3)^2}{360}$

$\dfrac{720}{9} = \dfrac{9X}{9}$

$80° = X$

inscribed angle $= \frac{1}{2}$(intercepted arc)

$\angle N = 40°$