

Key

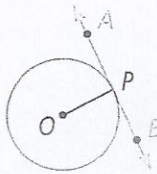
Math III Geometry Review

Circles

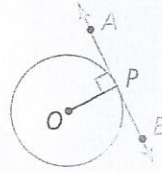
Equation of a circle $(x - h)^2 + (y - k)^2 = r^2$ where (h, k) is the center and r is the radius

A tangent line and the radius of a circle form a 90° angle.

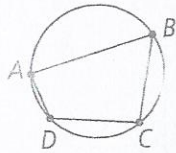
If ...
 \overleftrightarrow{AB} is tangent to $\odot O$ at P



Then ...
 $\overleftrightarrow{AB} \perp \overline{OP}$

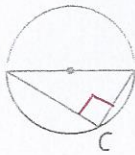


The opposite angles of a quadrilateral inscribed in a circle are supplementary

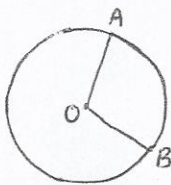


$$\begin{aligned}\angle B + \angle D &= 180 \\ \angle A + \angle C &= 180\end{aligned}$$

An angle inscribed in a semicircle is a right angle

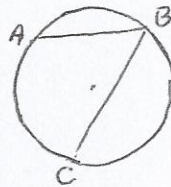


Central Angle



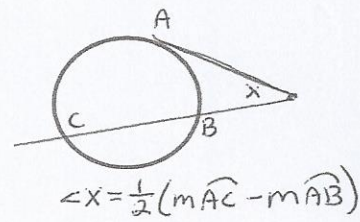
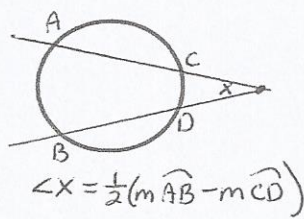
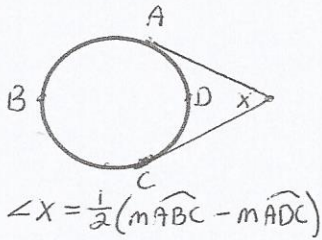
The measure of a central angle is equal to the arc it opens to

Inscribed Angle



The measure of the inscribed angle is $\frac{1}{2}$ of the arc it opens to

Circumscribed Angles



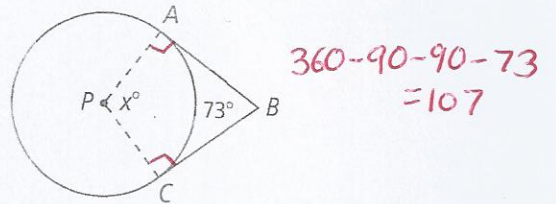
Area of a sector

$$\frac{\text{degree}}{360} \pi r^2$$

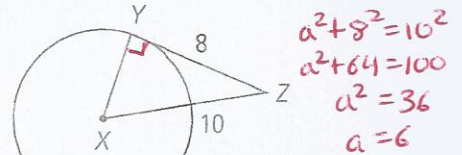
Length of a sector

$$\frac{\text{degree}}{360} 2\pi r$$

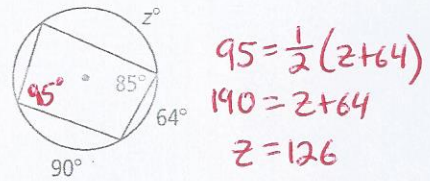
1. \overline{AB} and \overline{BC} are tangent to $\odot P$. What is the value of x .
 A. 73 **B. 107** C. 117 D. 146



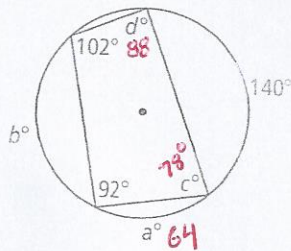
2. \overline{YZ} is tangent to $\odot X$, and X is the center of the circle. What is the length of the radius of the circle?
 A. 4 **B. 6** C. 12 D. 12.8



3. What is value of z ?
 A. 77 B. 95 **C. 126** D. 154



4. What is the value of $a, b, c,$ and d ?

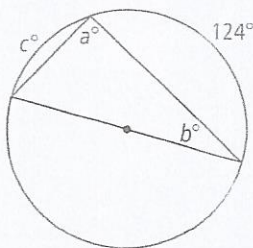


$a = 64$
 $b = 112$
 $c = 78^\circ$
 $d = 88^\circ$

$102 = \frac{1}{2}(140 + a)$
 $204 = 140 + a$
 $a = 64$

$88 = \frac{1}{2}(b + 64)$
 $176 = b + 64$
 $b = 112$

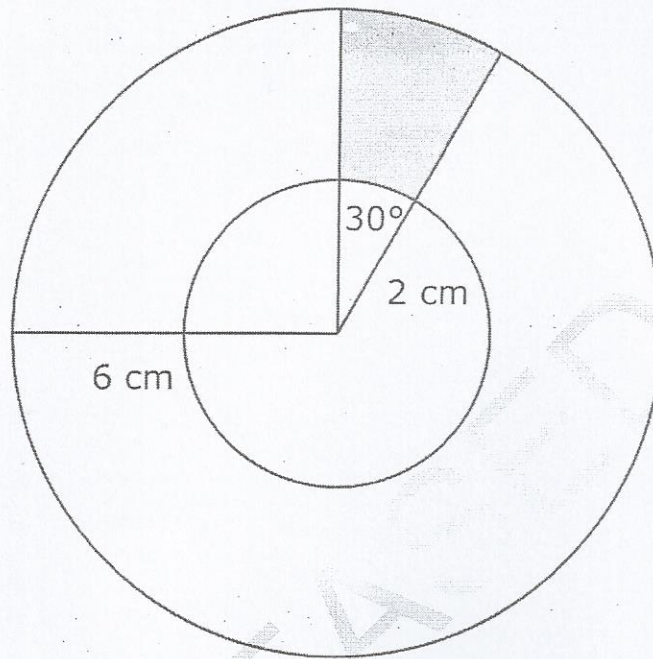
5. What is the value of $a, b,$ and c ?



$a = 90^\circ$
 $b = 28^\circ$
 $c = 56^\circ$

$180 - 124 = 56$
 $b = \frac{1}{2}(56)$
 $b = 28$

6. In the figure below, the larger circle has a radius of 6 cm, and the smaller circle has a radius of 2 cm.

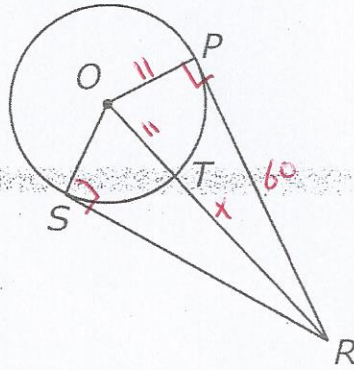


$$\frac{30}{360} \pi (6)^2 - \frac{30}{360} \pi (2)^2 = 8.377$$

What is the **approximate** area of the shaded region?

- A 2.1 cm²
- B 3.4 cm²
- C 4.2 cm²
- D 8.4 cm²

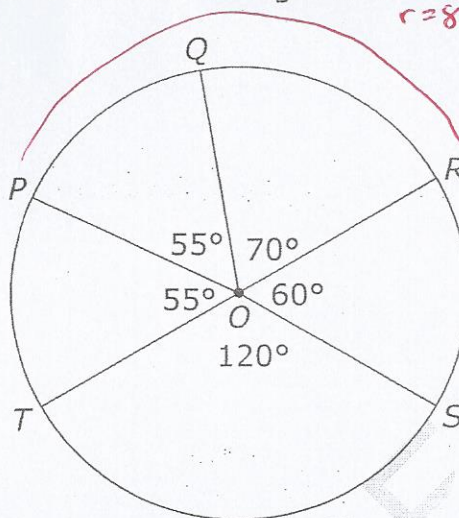
7. In the figure below, \overline{PR} and \overline{SR} are tangent to circle O .



$$\begin{aligned}
 11^2 + 60^2 &= (x+11)^2 \\
 3721 &= x^2 + 22x + 121 \\
 0 &= x^2 + 22x - 3600 \\
 &= (x-50)(x+72) \\
 x &= 50 \quad x = -72 \\
 \overline{OR} &= 50 + 11 = 61
 \end{aligned}$$

If $OT = 11$ cm and $PR = 60$ cm, what is the length of \overline{OR} ?

- (A) 61 cm
 B 59 cm
 C 50 cm
 D 48 cm
8. \overline{TR} is a diameter of circle O and has a length of 16 ft.



$$\begin{aligned}
 &\frac{125}{360} \pi (8^2) \\
 &= 69.81
 \end{aligned}$$

What is the **approximate** area of the sector bounded by $\angle POR$ and \widehat{PQR} ?

- (A) 70 ft²
 B 67 ft²
 C 42 ft²
 D 39 ft²

9. Derive the standard equation of the circle $x^2 + y^2 + 4x - 6y = -4$

$$x^2 + 4x + 4 + y^2 - 6y + 9 = -4 + 4 + 9$$

$$\left(\frac{4}{2}\right)^2 = 4 \quad \left(\frac{-6}{2}\right)^2 = 9$$

$$(x+2)^2 + (y-3)^2 = 9$$

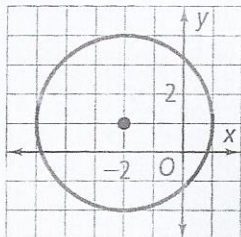
10. Which is the equation of a circle with center $(-2, 3)$ and a radius $r = 5$?

- A. $(x + 2)^2 + (y - 3)^2 = 10$ C. $(x - 2)^2 + (y + 3)^2 = 10$
 B. $(x + 2)^2 + (y - 3)^2 = 25$ D. $(x - 2)^2 + (y + 3)^2 = 25$

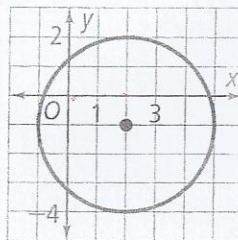
11. Which of the following is the graph of $(x - 2)^2 + (y + 1)^2 = 9$

center $(2, -1)$
 $r = 3$

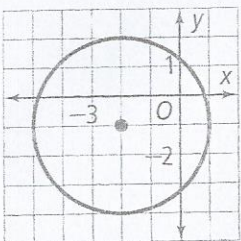
A.



C.



B.



D.

