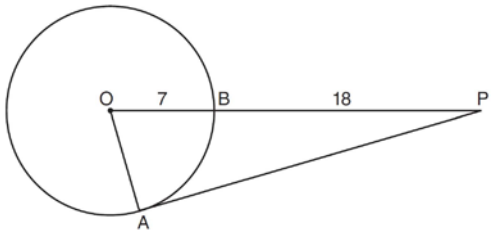
G.G.50: Tangents 1: Investigate, justify, and apply theorems about tangent lines to a circle: a perpendicular to the tangent at the point of tangency

1 The angle formed by the radius of a circle and a tangent to that circle has a measure of
1) 45°
2) 90°
3) 135°
4) 180°

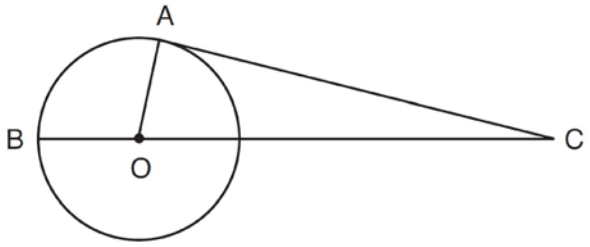
2 Line segment AB is tangent to circle O at A. Which type of triangle is always formed when points A, B, and O are connected?
1) right
2) obtuse
3) scalene
4) isosceles

3 In the diagram below of $\triangle PAO$, $\overline{AP}$ is tangent to circle O at point A, $OB = 7$, and $BP = 18$.



What is the length of $\overline{AP}$?
1) 10
2) 12
3) 17
4) 24

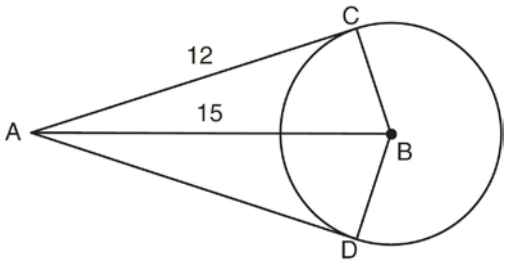
4 In the diagram below of circle O with radius $\overline{OA}$, tangent $\overline{CA}$ and secant $\overline{COB}$ are drawn.



(Not drawn to scale)

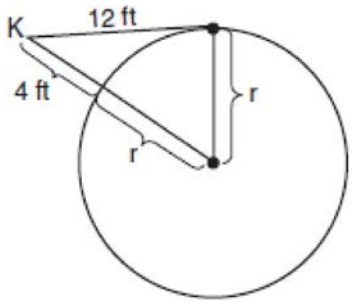
If $AC = 20$ cm and $OA = 7$ cm, what is the length of $\overline{OC}$, to the *nearest centimeter*?
1) 19
2) 20
3) 21
4) 27

5 In the diagram below, $\overline{AC}$ and $\overline{AD}$ are tangent to circle B at points C and D, respectively, and $\overline{BC}$, $\overline{BD}$, and $\overline{BA}$ are drawn.



If $AC = 12$ and $AB = 15$, what is the length of $\overline{BD}$?
1) 5.5
2) 9
3) 12
4) 18

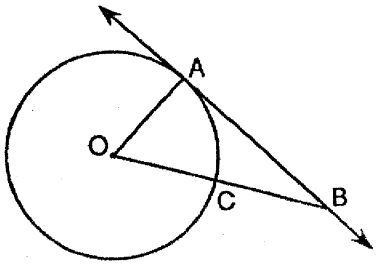
6 Kimi wants to determine the radius of a circular pool without getting wet. She is located at point K, which is 4 feet from the pool and 12 feet from the point of tangency, as shown in the accompanying diagram.



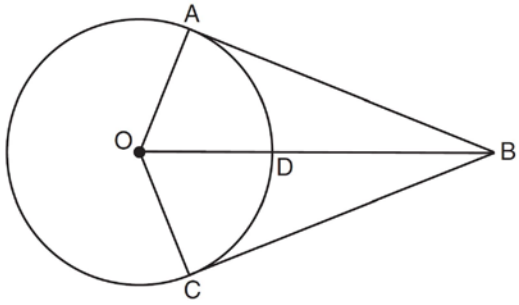
What is the radius of the pool?

1) 16 ft
2) 20 ft
3) 32 ft
4) $4\sqrt{10}$ ft

7 In the accompanying diagram, $\overleftrightarrow{BA}$ is tangent to circle O at A. Radii $\overline{OA}$ and $\overline{OC}$ are drawn, and $\overline{OC}$ is extended to intersect $\overleftrightarrow{BA}$ at B. If $BA = 15$ and $OB = 17$, find the measure of a radius of circle O.



8 As shown in the diagram below, $\overline{BO}$ and tangents $\overline{BA}$ and $\overline{BC}$ are drawn from external point B to circle O. Radii $\overline{OA}$ and $\overline{OC}$ are drawn.



If $OA = 7$ and $DB = 18$, determine and state the length of $\overline{AB}$.

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Answer Section

1 ANS: 2 REF: 081214ge
2 ANS: 1 REF: 061013ge
3 ANS: 4
$\sqrt{25^2 - 7^2} = 24$

REF: 081105ge
4 ANS: 3
$\sqrt{20^2 + 7^2} \approx 21$

REF: 081525ge
5 ANS: 2
$\sqrt{15^2 - 12^2} = 9$

REF: 081325ge
6 ANS: 1 REF: 080518b
7 ANS:
8

REF: 089408siii
8 ANS:
$x^2 + 7^2 = 25^2$

$x^2 + 49 = 625$

$x^2 = 576$

$x = 24$

REF: 061433ge