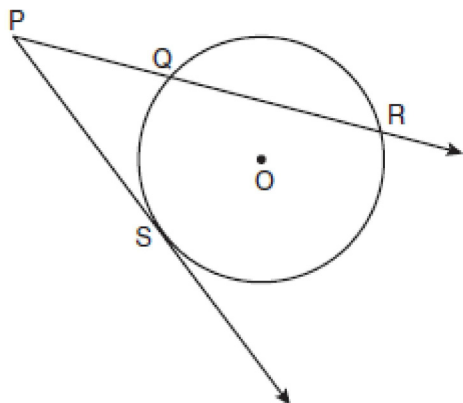


G.G.53: Segments Intercepted by Circle 3: Investigate and apply theorems regarding segments intersected by a circle: along a tangent and a secant from the same external point

- 1 In the diagram below, \overline{PS} is a tangent to circle O at point S , \overline{PQR} is a secant, $PS = x$, $PQ = 3$, and $PR = x + 18$.

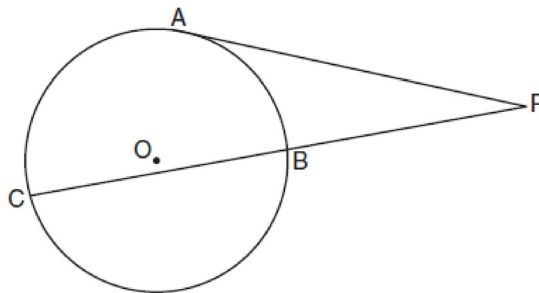


(Not drawn to scale)

What is the length of \overline{PS} ?

- 1) 6
- 2) 9
- 3) 3
- 4) 27

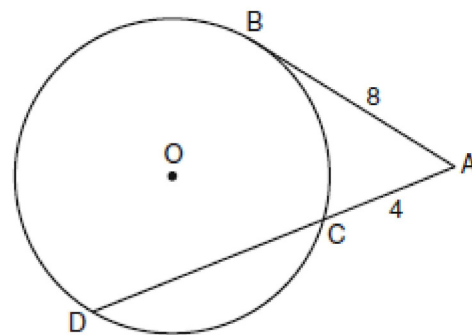
- 2 In the diagram below, tangent \overline{PA} and secant \overline{PBC} are drawn to circle O from external point P .



If $PB = 4$ and $BC = 5$, what is the length of \overline{PA} ?

- 1) 20
- 2) 9
- 3) 8
- 4) 6

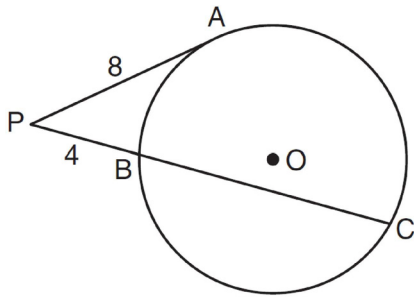
- 3 In the diagram below, tangent \overline{AB} and secant \overline{ACD} are drawn to circle O from an external point A , $AB = 8$, and $AC = 4$.



What is the length of \overline{CD} ?

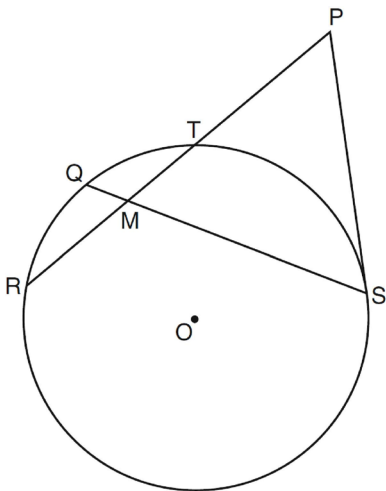
- 1) 16
- 2) 13
- 3) 12
- 4) 10

- 4 In the diagram below of circle O , \overline{PA} is tangent to circle O at A , and \overline{PBC} is a secant with points B and C on the circle.



If $PA = 8$ and $PB = 4$, what is the length of \overline{BC} ?

- 1) 20
 - 2) 16
 - 3) 15
 - 4) 12
- 5 In the diagram below of circle O , chords \overline{RT} and \overline{QS} intersect at M . Secant \overline{PTR} and tangent \overline{PS} are drawn to circle O . The length of \overline{RM} is two more than the length of \overline{TM} , $QM = 2$, $SM = 12$, and $PT = 8$.



Find the length of \overline{RT} . Find the length of \overline{PS} .

G.G.53: Segments Intercepted by Circle 3: Investigate and apply theorems regarding segments intersected by a circle: along a tangent and a secant from the same external point

Answer Section

1 ANS: 2

$$x^2 = 3(x + 18)$$

$$x^2 - 3x - 54 = 0$$

$$(x - 9)(x + 6) = 0$$

$$x = 9$$

REF: fall0817ge

2 ANS: 4

$$x^2 = (4 + 5) \times 4$$

$$x^2 = 36$$

$$x = 6$$

REF: 011008ge

3 ANS: 3

$$4(x + 4) = 8^2$$

$$4x + 16 = 64$$

$$x = 12$$

REF: 060916ge

4 ANS: 4

$$4(x + 4) = 8^2$$

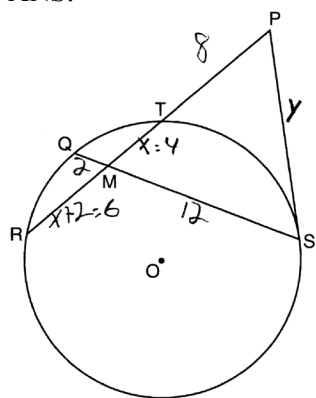
$$4x + 16 = 64$$

$$4x = 48$$

$$x = 12$$

REF: 061117ge

5 ANS:



$$x(x+2) = 12 \cdot 2. \quad \overline{RT} = 6+4 = 10. \quad y \cdot y = 18 \cdot 8$$

$$x^2 + 2x - 24 = 0$$

$$y^2 = 144$$

$$(x+6)(x-4) = 0$$

$$y = 12$$

$$x = 4$$

REF: 061237ge