Chords, secants, and tangents are shown. Find the value of x.
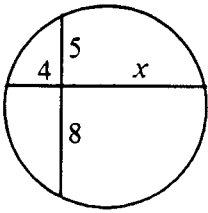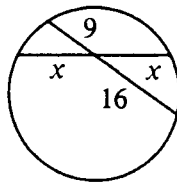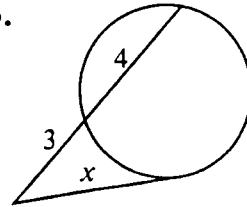
A **1.**
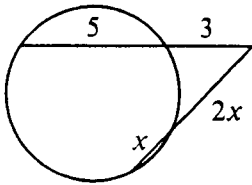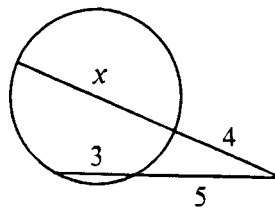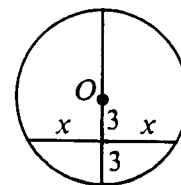

2.

3.
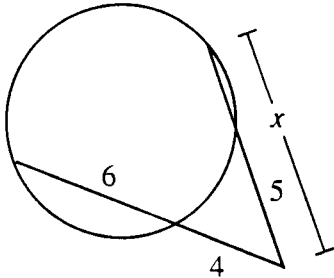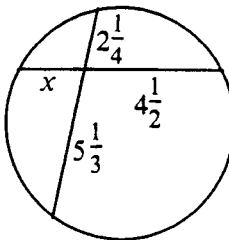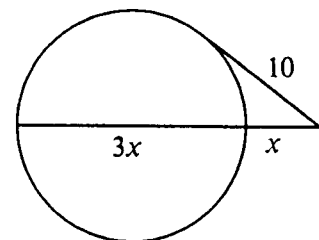

4.

5.

6.

7.

8.

9.

Chords $\overline{AB}$ and $\overline{CD}$ intersect at P. Find the lengths indicated.

Example $AP = 5$; $BP = 4$; $CD = 12$; $CP = $ ___?___

Solution Let $CP = x$. Then $DP = 12 - x$.
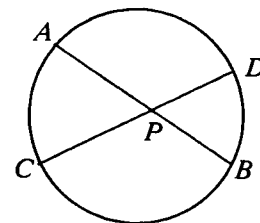$$x(12 - x) = 5 \cdot 4$$
$$12x - x^2 = 20$$
$$x^2 - 12x + 20 = 0$$
$$(x - 2)(x - 10) = 0$$
$$x = 2 \text{ or } x = 10$$
$$CP = 2 \text{ or } 10$$

13. $AP = 6$; $BP = 8$; $CD = 16$; $DP = $ ___?___
14. $CD = 10$; $CP = 6$; $AB = 11$; $AP = $ ___?___
15. $AB = 12$; $CP = 9$; $DP = 4$; $BP = $ ___?___
16. $AP = 6$; $BP = 5$; $CP = 3 \cdot DP$; $DP = $ ___?___

$\overline{PT}$ is tangent to the circle. Find the lengths indicated.

17. $PT = 6$; $PB = 3$; $AB = $ ___?___
18. $PT = 12$; $CD = 18$; $PC = $ ___?___
19. $PD = 5$; $CD = 7$; $AB = 11$; $PB = $ ___?___
20. $PB = AB = 5$; $PD = 4$; $PT = $ ___?___ and $PC = $ ___?___