

12-2 Reteaching

Chords and Arcs

Several relationships between chords, arcs, and the central angles of a circle are listed below. The converses of these theorems are also true.

Theorem 12-4 Congruent central angles have congruent arcs.

Theorem 12-5 Congruent central angles have congruent chords.

Theorem 12-6 Congruent chords have congruent arcs.

Theorem 12-7 Chords equidistant from the center are congruent.

Problem

What is the value of x ?

$$EF = FG = 3.2$$

Given

$$\overline{AB} \cong \overline{DC}$$

Chords equidistant from the center of a circle are congruent.

$$DC = DG + GC$$

Segment Addition Postulate

$$AB = x + GC$$

Substitution

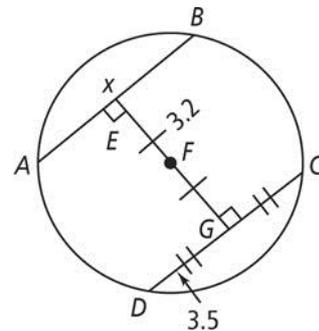
$$DG = GC = 3.5$$

Given

$$x = 3.5 + 3.5 = 7$$

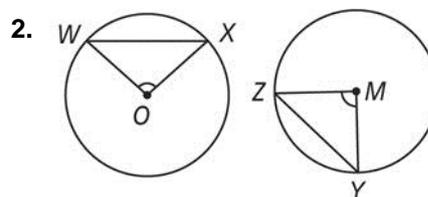
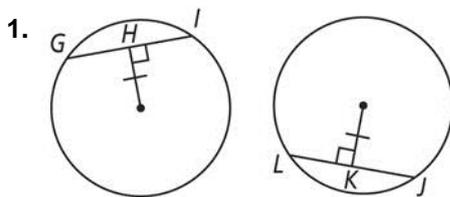
Substitution

The values of x is 7.

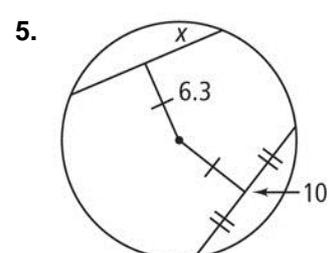
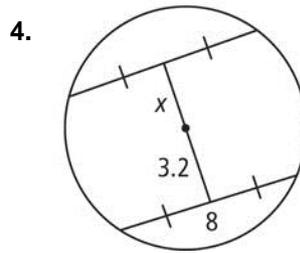
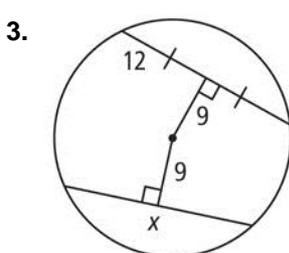


Exercises

In Exercises 1 and 2, the circles are congruent. What can you conclude?



Find the value of x .



12-2 **Reteaching** (continued)

Chords and Arcs

Useful relationships between diameters, chords, and arcs are listed below. To bisect a figure means to divide it exactly in half.

Theorem 12-8 In a circle, if a diameter is perpendicular to a chord, it bisects that chord and its arc.

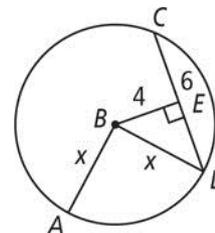
Theorem 12-9 In a circle, if a diameter bisects a chord that is not a diameter of the circle, it is perpendicular to that chord.

Theorem 12-10 If a point is an equal distance from the endpoints of a line segment, then that point lies on the perpendicular bisector of the segment.

Problem

What is the value of x to the nearest tenth?

In this problem, x is the radius. To find its value draw radius \overline{BD} , which becomes the hypotenuse of right $\triangle BED$. Then use the Pythagorean Theorem to solve.



$ED = CE = 3$ A diameter perpendicular to a chord bisects the chord.

$x^2 = 3^2 + 4^2$ Use the Pythagorean Theorem.

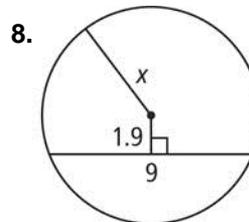
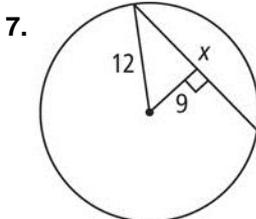
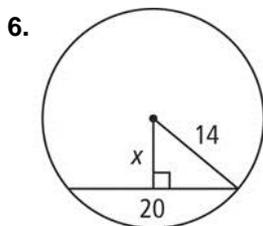
$x^2 = 9 + 16 = 25$ Solve for x^2 .

$x = 5$ Find the positive square root of each side.

The value of x is 5.

Exercises

Find the value of x to the nearest tenth.



Find the measure of each segment to the nearest tenth.

9. Find c when $r = 6$ cm and $d = 1$ cm.
10. Find c when $r = 9$ cm and $d = 8$ cm.
11. Find d when $r = 10$ in. and $c = 10$ in.
12. Find d when $r = 8$ in. and $c = 15$ in.

