

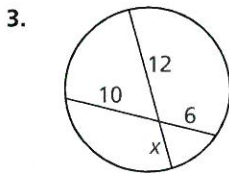
10.6 Exercises

Vocabulary and Core Concept Check

- VOCABULARY** The part of the secant segment that is outside the circle is called a(n) *external segment*.
 one point on O two points on O
- WRITING** Explain the difference between a tangent segment and a secant segment.

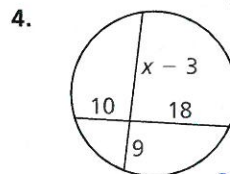
Monitoring Progress and Modeling with Mathematics

In Exercises 3–6, find the value of x . (See Example 1.)



$$12x = 60$$

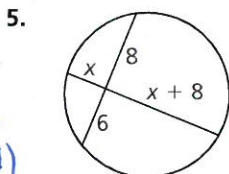
$$x = 5$$



$$9(x-3) = 180$$

$$x-3 = 20$$

$$x = 23$$

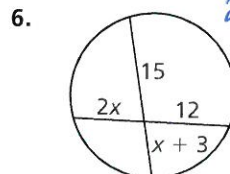


$$48 = x^2 + 8x$$

$$0 = x^2 + 8x - 48$$

$$0 = (x+12)(x-4)$$

$$x = 4$$



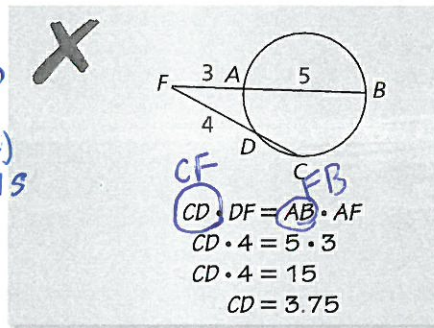
$$2x \cdot 12 = 15(x+3)$$

$$24x = 15x + 45$$

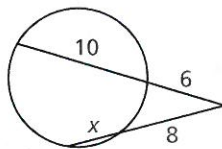
$$9x = 45$$

$$x = 5$$

15. **ERROR ANALYSIS** Describe and correct the error in finding CD .



In Exercises 7–10, find the value of x . (See Example 2.)

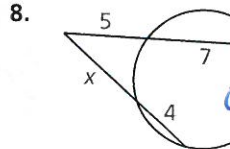


$$6(16) = 8(x+8)$$

$$96 = 8x + 64$$

$$32 = 8x$$

$$4 = x$$



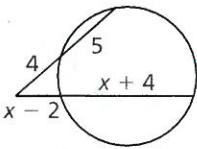
$$5(12) = x(x+7)$$

$$60 = x^2 + 7x$$

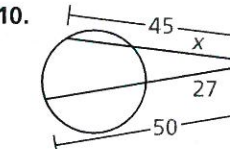
$$0 = x^2 + 7x - 60$$

$$0 = (x+10)(x-6)$$

$$x = 6$$



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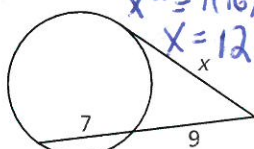


$$x(45) = 27 \cdot 50$$

$$45x = 1350$$

$$x = 30$$

In Exercises 11–14, find the value of x . (See Example 3.)



$$1 \cdot 9 = (x-2)(2x+2)$$

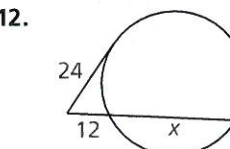
$$9 = 2x^2 - 2x - 4$$

$$13 = 2x^2 - 2x$$

$$0 = x^2 - x - 2$$

$$0 = (x-2)(x+1)$$

$$x = 2$$

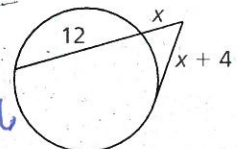


$$24^2 = 12(12+x)$$

$$576 = 144 + 12x$$

$$432 = 12x$$

$$36 = x$$

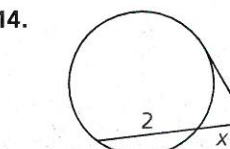


$$x(x+12) = (x+4)^2$$

$$x^2 + 12x = x^2 + 8x + 16$$

$$4x = 16$$

$$x = 4$$



$$(\sqrt{3})^2 = x(x+2)$$

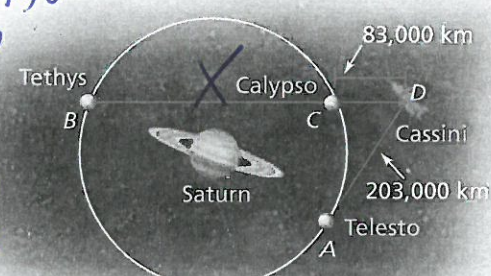
$$3 = x^2 + 2x$$

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

$$0 = (x+3)(x-1)$$

$$x = 1$$

16. **MODELING WITH MATHEMATICS** The Cassini spacecraft is on a mission in orbit around Saturn until September 2017. Three of Saturn's moons, Tethys, Calypso, and Telesto, have nearly circular orbits of radius 295,000 kilometers. The diagram shows the positions of the moons and the spacecraft on one of Cassini's missions. Find the distance DB from Cassini to Tethys when AD is tangent to the circular orbit. (See Example 4.)



$$203,000^2 = 83,000(83,000+x)$$