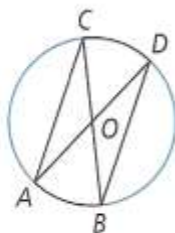# *GEOMETRY*
Sections 12-2 & 12-3

Lesson Check

Do you know HOW?

In $\odot O$, $m\overarc{CD} = 50$ and $\overline{CA} \cong \overline{BD}$.
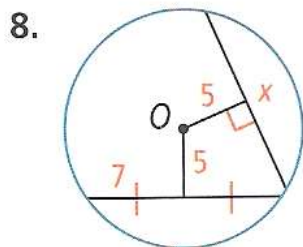
3. Since $CA = BD$, what do you know about the distance of $\overline{CA}$ and $\overline{BD}$ from the center of $\odot O$?
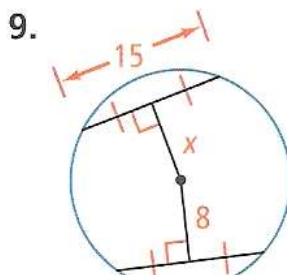
Do you UNDERSTAND? MATHEMATICAL PRACTICES

4. **Vocabulary** Is a radius a chord? Is a diameter a chord? Explain your answers.

3.   = (same ≅)
4.   segment that connects 2 points on a circle. Yes, a diameter is a chord, since it connects 2 points on a circle.
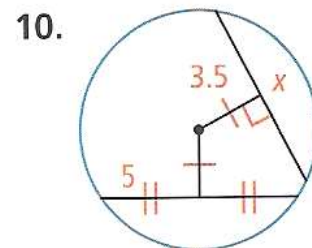
Find the value of *x*.
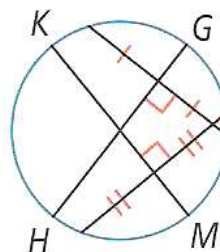
8.

9.

10.

8.   7 + 7 = 14
9.   8
10.   5 + 5 = 10

11. In the diagram at the right, $\overline{GH}$ and $\overline{KM}$ are perpendicular bisectors of the chords they intersect. What can you conclude about the center of the circle? Justify your answer.
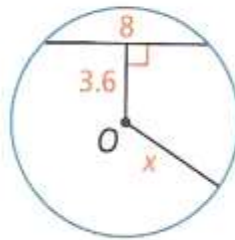
11.   The center of the circle is the point where $\overline{KM}$ and $\overline{GH}$ intersect, because those segments are the perpendicular bisectors of 2 chords.
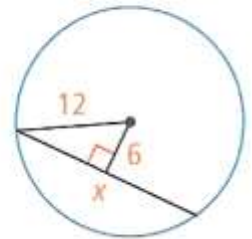
Algebra Find the value of x to the nearest tenth.

13.
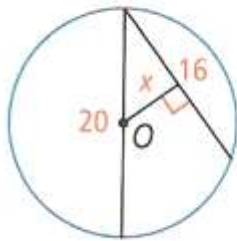
14.

15.

13. $x^2 + 8^2 = 10^2$

```
10²-8²
√(Ans       36
            6
```

14. $4^2 + 3.6^2 = x^2$

```
4²+3.6²
          28.96
√(Ans
       5.381449619
```

15. If n = ½x, then
$x^2 + 6^2 = 12^2$

```
12²-6²
          108
√(Ans
      10.39230485
```

x = 2n, so x = 20.8

16. Geometry in 3 Dimensions In the figure at the right, sphere O with radius 13 cm is intersected by a plane 5 cm from center O. Find the radius of the cross section $\odot A$.
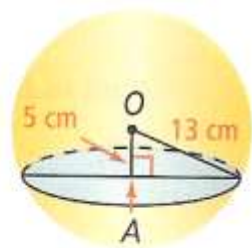
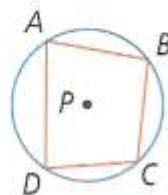**15.** $r^2 + 5^2 = 13^2$

```
13²-5²
          144
√(Ans
          12
```

Lesson Check

Do you know HOW?

Use the diagram for Exercises 1–3.

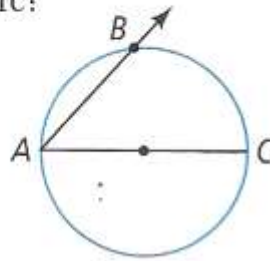1. Which arc does $\angle A$ intercept?

2. Which angle intercepts $\overset{\frown}{ABC}$?

1. $\overset{\frown}{DCB}$ (or $\overset{\frown}{BCD}$)
2. $\angle D$ (or $\angle ADC$ or $\angle CDA$)

## Do you UNDERSTAND? © MATHEMATICAL PRACTICES

© **4. Vocabulary** What is the relationship between an inscribed angle and its intercepted arc?

© **5. Error Analysis** A classmate says that $m\angle A = 90$. What is your classmate's error?
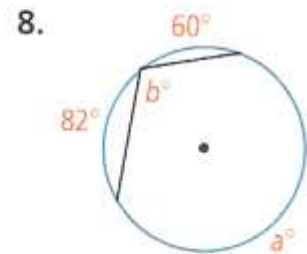
4.   The inscribed angle measures HALF the intercepted arc (or the arc is twice the angle).

5. $\angle A$ intercepts $\overset{\frown}{BC}$, which is less than 180°, so half of the arc would be LESS than 90.

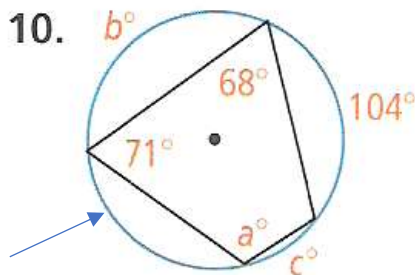Find the value of each variable. For each circle, the dot represents the center.

6.

116°

$a°$

8.

60°

$b°$

82°

$a°$
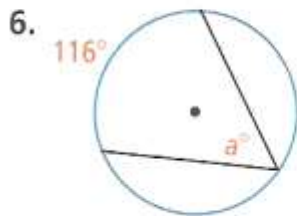
6. $116 \div 2 = 58$

8.   a = 198 and b = 99

```
360-80-82
              198
Ans/2
               99
■
```

10.

$b°$
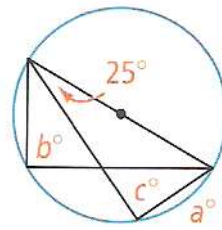
68°

104°

71°

$a°$

$c°$

10.   **DON'T WORRY ABOUT THIS PROBLEM … BUT, HERE'S HOW TO DO IT.**
       FIRST: The arc at "c" + the blank arc at the bottom (where the arrow is) = twice 68
              This means c + the blank area = 136.
       SECOND: $b + 136 + 104 = 360$, so $\underline{b = 120}$
       THIRD: "a" is half of $120 + 104$, so $\underline{a = 112}$
       FINALLY: $c + 104$ is twice 71, so $c + 104 = 142$, so $\underline{c = 38}$
       (You could do these several other ways, but the answers should be the same.)

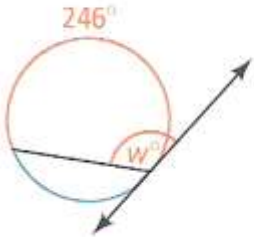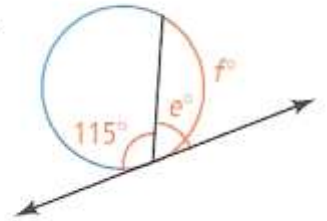**12.**
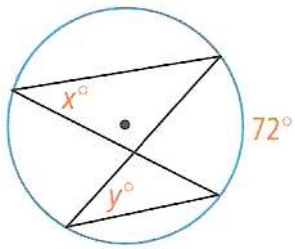
14.

12. $x = 36$ and $y = 36$

14. $a = 50$, $b = 90$ **(half of semicircle)**, $c = 90$

Find the value of each variable. Lines that appear to be tangent are tangent.

16.

18.

16. $w = 246 \div 2 = 123$

18. $e = 180 - 115 = 65$
$f = 65 * 2 = 130$