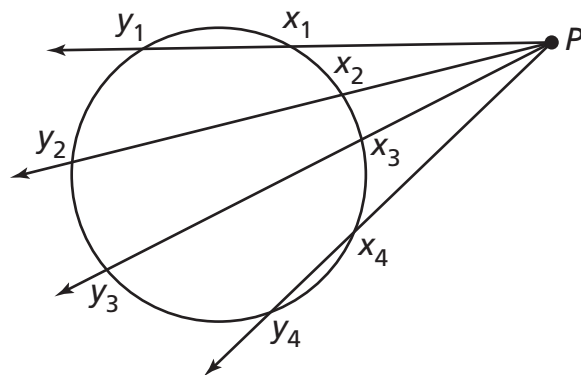## 10.6 Start Thinking

Draw a diagram similar to the one shown to the right with a 10-centimeter diameter circle, a point P outside the circle, and four rays passing through the circle. Label the points of intersection as shown. Use a ruler to find the measures of the following segments. What relationship exists between each pair of measurements?

1. $\overline{PX_1}, \overline{PY_1}$ **2.** $\overline{PX_2}, \overline{PY_2}$ **3.** $\overline{PX_3}, \overline{PY_3}$ **4.** $\overline{PX_4}, \overline{PY_4}$
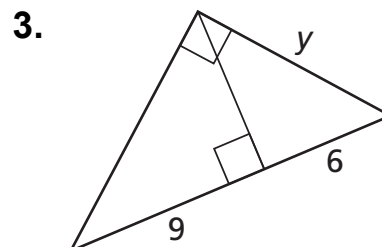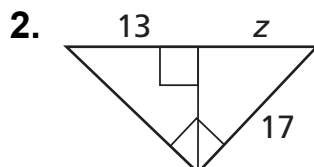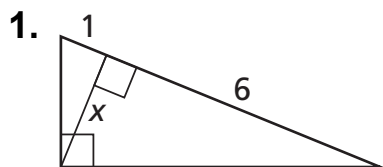
10.6 Warm Up

Solve the equation.

1. $4(7 + 4) = 2(x + 6)$

2. $x(x + 5) = (x + 1)(x + 2)$

3. $2x(5) = (2x + 3)(x + 1)$

4. $(x + 2)(x + 5) = 2x(x + 2)$

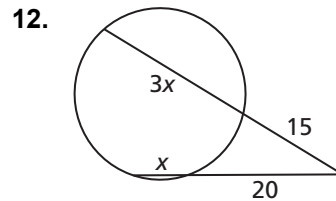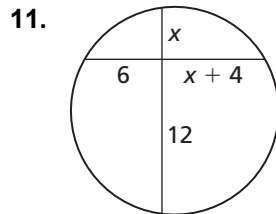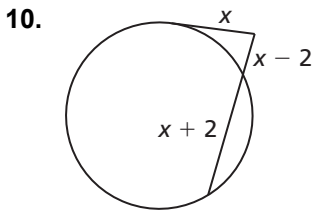**5.** $(x + 4)(x + 2) = 2x(x - 3)$
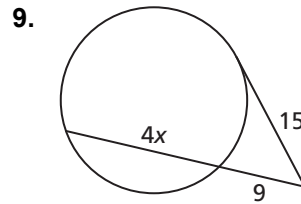
6. $(2x - 1)(x + 5) = (x + 1)(x + 2)$

10.6 Cumulative Review Warm Up

Find the value of the variable.

1.

2.

3.

Name _____ Date _____

10.6 Practice A

In Exercises 1–12, find the value of *x*.

1.

23

23   15

x

2.

3
x

6

4

3.

x

16   6

8

4.

x

3

10   2

5.

3   5

4

x

6.

4

6

5   *x*

7.

10

5

x

8.

x

7

9

9.

15

4*x*

9

10.

x

x − 2

x + 2

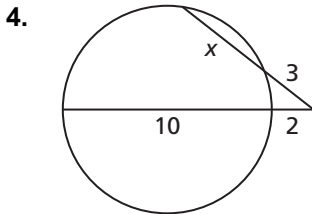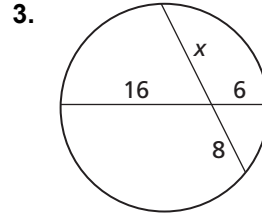**11.**

x

6   *x* + 4

12

12.

3*x*

15

x

20
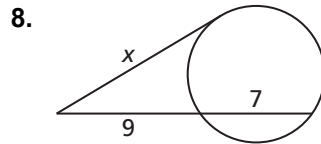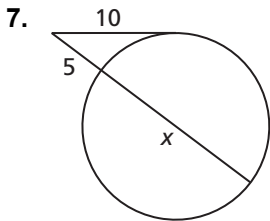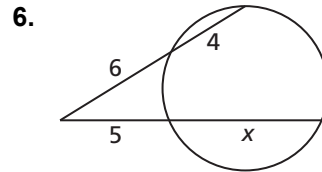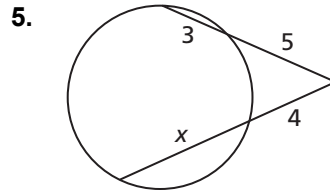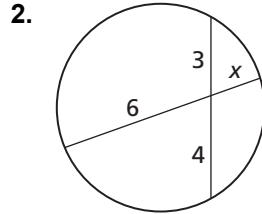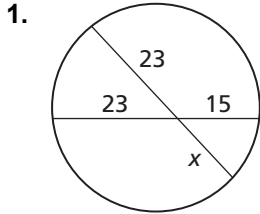
13. The Xs show the positions of two basketball
teammates relative to the circular "key" on a
basketball court. The player outside the key
passes the ball to the player on the key.
What is the length of the pass?

5 ft   6 ft

12 ft

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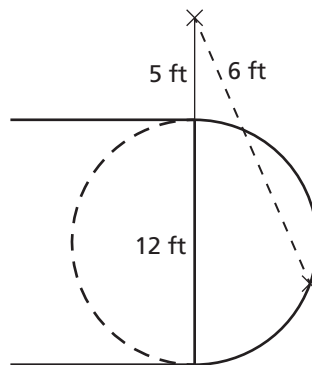# 10.6 Practice B

In Exercises 1–9, find the value of *x*.

1.

$x + 5$
$2x$ 21
28

2.

42 20
x

3.

$2x$
4
3 $3x + 1$

4.

$3x$
10
$2x$

5.

$x + 2$ $2x - 8$
$2x - 5$
$x + 1$

6.

$3x - 3$
$2x$
$x + 6$
x

7.

8
$x + 3$
10
$x - 3$

8.

$x + 10$
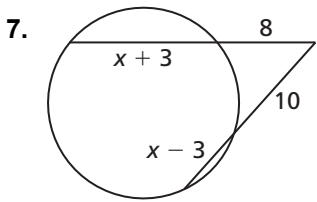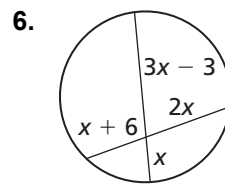x
$x + 13$
$x + 1$

9.

24 x
36
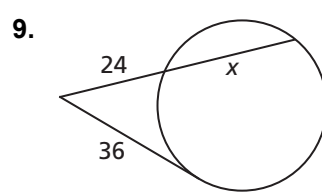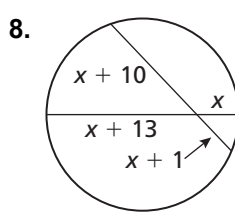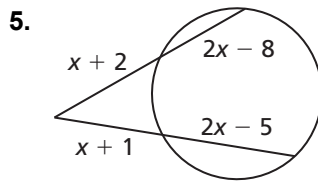
10. A large industrial winch is shown.
There are 15 inches of cable hanging
free off of the spool and the distance
from the end of the cable to the spool
is 8 inches. What is the diameter of
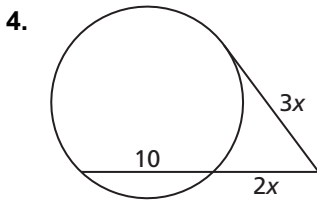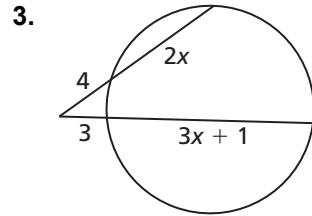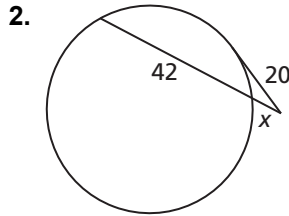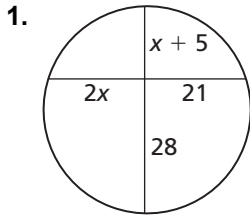the spool?

15 in.

8 in.
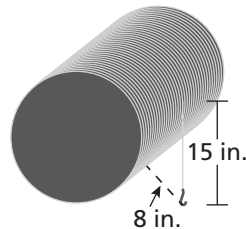
11. The diagram shows a cross-section of a
large storm drain pipe with a small amount
of standing water. The distance across the
surface of the water is 48 inches and the
water is 4.25 inches deep at its deepest
point. What is the diameter of the storm
drain pipe?

4.25 in.

|— 48 in. —|
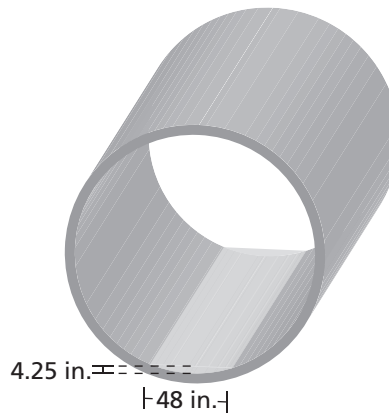
10.6 Enrichment and Extension

Segment Relationships

In Exercises 1 and 2, find the indicated measurement(s).

1. AC and BD

2. PY

3. In the diagram, $\overline{EF}$ is a tangent segment, $m\widehat{AD} = 140°$, $m\widehat{AB} = 20°$, $m\angle EFD = 60°$, $AC = 6$, $AB = 3$, and $DC = 10$.
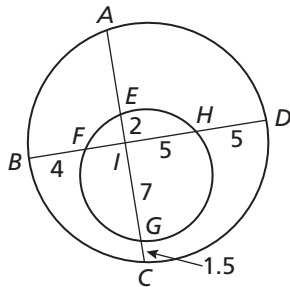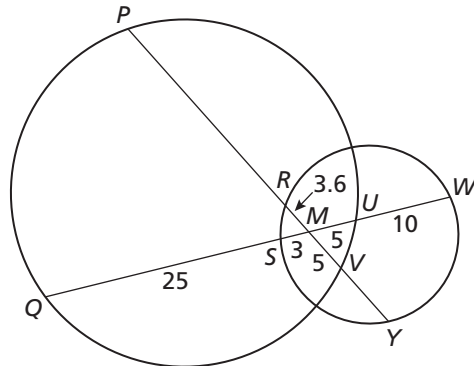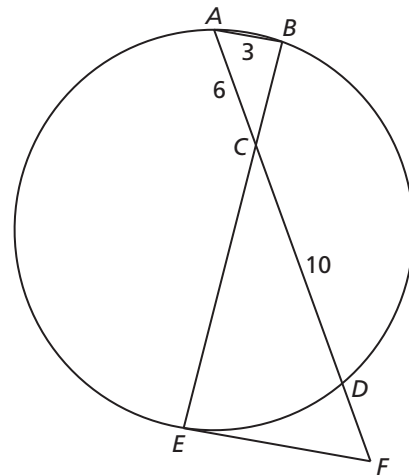

   a. Find $m\angle CAB$.

   b. Show that $\triangle ABC \sim \triangle FEC$.

   c. Let $EF = y$ and $DF = x$. Use the results of part (b) to write a proportion involving x and y. Solve for y.

   d. Use a theorem from this section to write another equation involving x and y.

   e. Use the results of parts (c) and (d) to solve for x and y.

   f. Find CE. Explain your reasoning.

4. Write a paragraph proof for the following.

   Given: $\overline{QT}$ is tangent to both circles at T.

   Prove: $OP \bullet OQ = OR \bullet OS$.
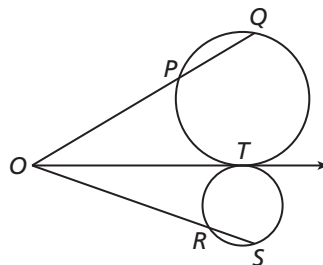
Name_____ Date _____

Why Won't The Circles Invite The Ellipses Over For Dinner?

| A	B	C	D	E	F
G	H	I			

Complete each exercise. Find the answer in the answer column. Write the word under the answer in the box containing the exercise letter.

15 ROUND	
2 COMPLEX	
interior BECAUSE	
8 LUNCH	
6 TOO	
60 THE	
side SQUARE	
cotangent FOOD	
external ARE	

Complete the sentence.

A. When two chords intersect in the _____ of a circle, each chord is divided into two segments that are called segments of the chord.

B. A tangent segment is a segment that is tangent to a circle at a(n) _____.

C. A(n) _____ segment is a segment that contains a chord of a circle and has exactly one endpoint outside the circle.

D. The part of a secant segment that is outside the circle is called a(n) _____ segment.

Find the value of x.

E.

9 12 8 x

F.

3 2 7 x

G.

x 48 2

H.

16 4 x

I.

x + 2 x 3 2
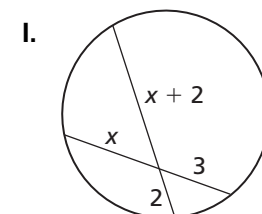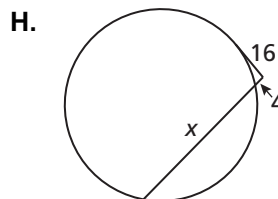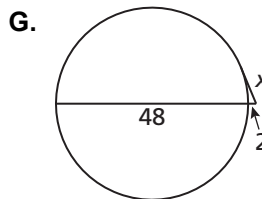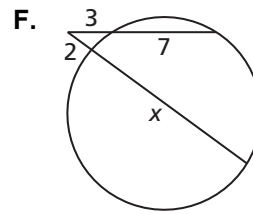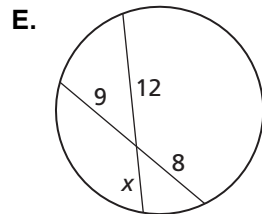
endpoint THE	
16 EAT	
3 ALWAYS	
13 ECCENTRIC	
exterior SNOB	
4 CIRCLES	
secant ELLIPSES	
center NICE	
10 FOR	