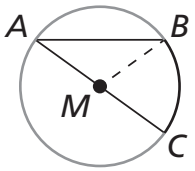
10.4 Start Thinking

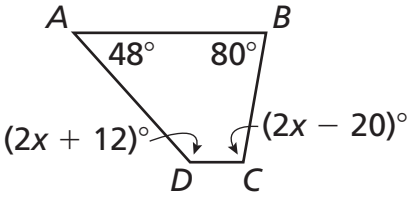
Consider $\odot M$ shown in the diagram. How are $m\angle BMC$ and $m\overset{\frown}{BC}$ related? How are $m\angle A$ and $m\angle B$ related? Explain your answer. Use this information to make a conclusion about the relationship between $m\overset{\frown}{BC}$ and $m\angle A$.



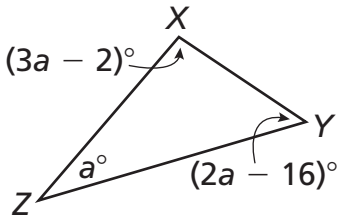
10.4 Warm Up

Find the measure of each angle in the polygon.

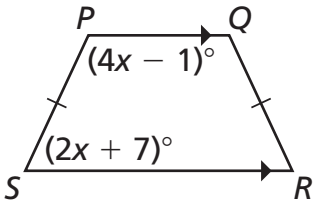
1.



2.



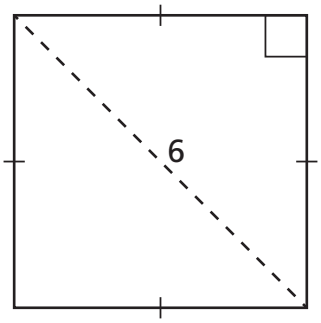
3.



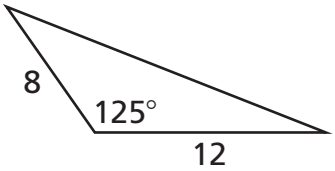
10.4 Cumulative Review Warm Up

Find the area of the geometric figure. Round your answer to the nearest tenth, when necessary.

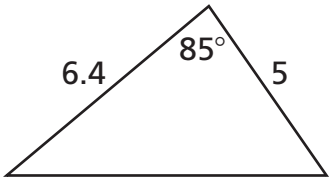
1.



2.



3.



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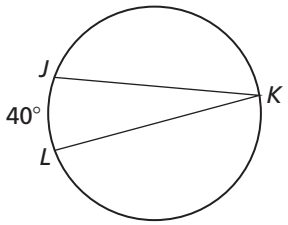
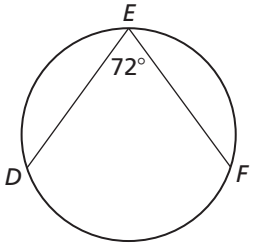
10.4 Practice A

In Exercises 1–3, find the indicated measure.

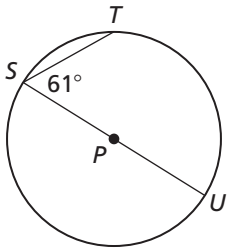
1. $m\angle K$



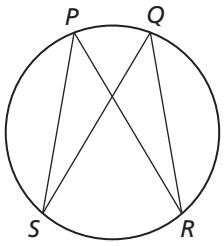
2. $m\overset{\frown}{DF}$



3. $m\overset{\frown}{ST}$



4. In the diagram shown, which statement is true? Explain.

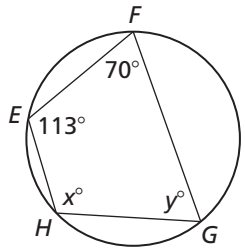


A. $\angle SPR \cong \angle PSQ$ **B.** $\angle RQS \cong \angle RPS$

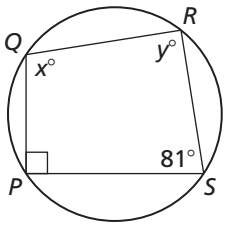
C. $\angle RPS \cong \angle PRQ$ **D.** $\angle PRQ \cong \angle SQR$

In Exercises 5–7, find the value of each variable.

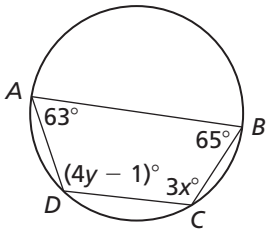
5.



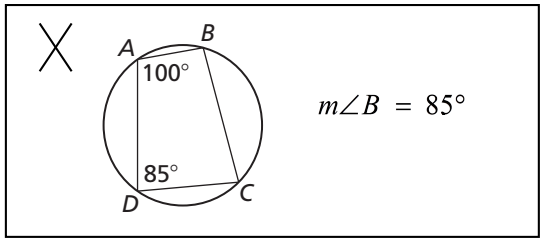
6.



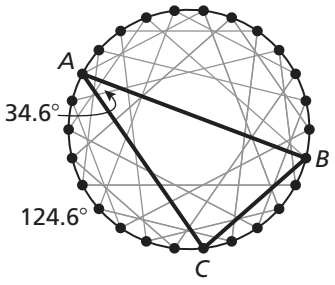
7.



8. Describe and correct the error in finding $m\angle B$.



9. You make a design using a pencil and a circular wheel, as shown.



a. Find $m\angle ABC$.

b. Find $m\angle ACB$.

c. What type of triangle is $\triangle ABC$? Explain.

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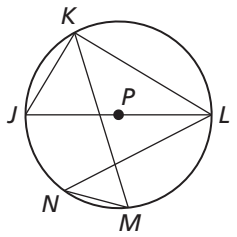
10.4 Practice B

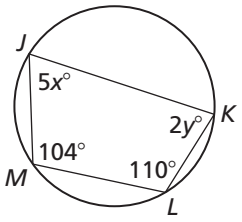
In Exercises 1–8, find the measure of the indicated arc or angle in $\odot P$ given $m\overset{\frown}{LM} = 84°$ and $m\overset{\frown}{KN} = 116°$.



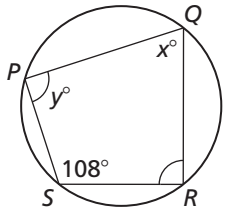
1. $m\angle JKL$
2. $m\angle MKL$
3. $m\angle KMN$
4. $m\angle JKM$
5. $m\angle KLN$
6. $m\angle LNM$
7. $m\overset{\frown}{MJ}$
8. $m\overset{\frown}{LKJ}$

In Exercises 9–11, find the value of each variable.

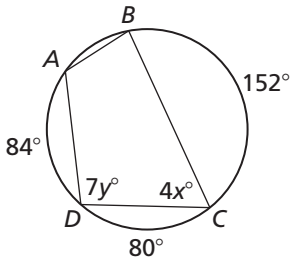
9.



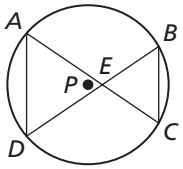
10.



11.



12. Copy and complete the proof.



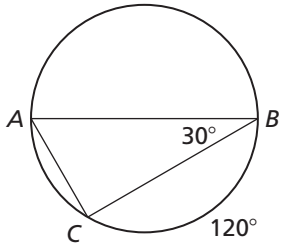
Given: $\odot P$

Prove: $\triangle AED \sim \triangle BEC$

STATEMENTS	REASONS
1. $\odot P$	1. Given
2. _____	2. Vertical Angles Congruence Theorem (Thm. 2.6)
3. $\angle CAD \cong \angle DBC$	3. _____
4. $\triangle AED \sim \triangle BEC$	4. _____

13. Your friend claims that the angles $\angle ADB$ and $\angle BCA$ could be used in Step 3 of Exercise 12. Is your friend correct? Explain your reasoning.

14. Determine whether $\overline{AB}$ is a diameter of the circle. Explain your reasoning.



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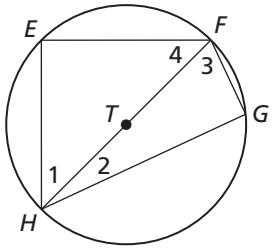
10.4 Enrichment and Extension

Inscribed Angles and Polygons

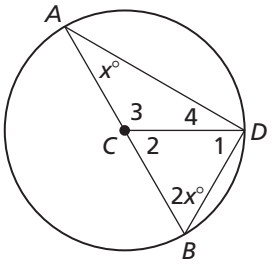
1. Triangles EFH and FGH are inscribed in circle T with $\overset{\frown}{EH} \cong \overset{\frown}{EF}$. Find the measure of each numbered angle if $m\angle 2 = 3a + 2$ and $m\angle 3 = 12a - 2$.



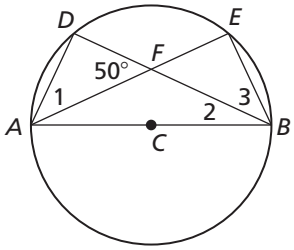
2. A regular 13-gon is inscribed in a circle. Find the measure of each arc intercepted by the sides of the polygon. Round your answer to the nearest hundredth of a degree.

In Exercises 3 and 4, find the measure of the numbered angles in the figure.

3.



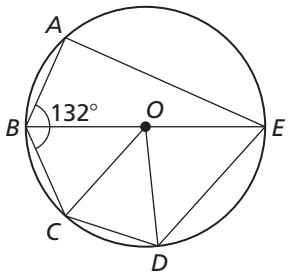
4.



In Exercises 5 and 6, use the figure below, which shows a pentagon inscribed in circle *O*. Assume $\overline{AB} \cong \overline{BC} \cong \overline{CD}$ and $m\angle ABC = 132°$.

5. Find $m\angle AEB$.

6. Find $m\angle COD$.



7. A puzzle in the form of a quadrilateral is inscribed in a circle. The vertices of the quadrilateral divide the circle into four arcs in a ratio of 1 : 2 : 5 : 4. Find the angle measures of the quadrilateral.

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10.4 Puzzle Time

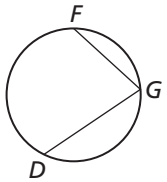
How Did The Lettuce Get An A On The Test?

Write the letter of each answer in the box containing the exercise number.

Complete the sentence.

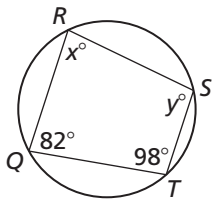
1. A(n) _____ angle is an angle whose vertex is on a circle and whose sides contain chords of the circle.
2. An arc that lies between two lines, rays, or segments is called a(n) _____ arc.
3. If the endpoints of a chord or arc lie on the sides of an inscribed angle, the chord or arc is said to _____ the angle.
4. The measure of an inscribed angle is _____ the measure of its intercepted arc.
5. If two inscribed angles of a circle intercept the same arc, then the angles are _____.
6. A polygon is an inscribed polygon when all of its _____ lie on a circle.
7. The circle that contains the vertices of a polygon is a(n) _____ circle.
8. If a right triangle is inscribed in a circle, then the hypotenuse is a(n) _____ of the circle.
9. A quadrilateral can be inscribed in a circle if and only if its opposite angles are _____.

Find the indicated measure using the diagram.



10. $m\overset{\frown}{FG} = 98°$, $m\overset{\frown}{GD} = 142°$; Find $m\angle G$.
11. $m\angle G = 78°$; Find $m\overset{\frown}{FD}$.

Find the indicated measure using the diagram.



12. $x° =$
13. $y° =$

Answers

I.	inscribed	**A.**	89°
A.	intercepted	**S.**	subtend
H.	complementary		
R.	71°	**D.**	$\frac{1}{2}$
T.	congruent	**M.**	upset
E.	vertices	**P.**	39°
U.	circumscribed	**N.**	sides
I.	diameter	**N.**	inclined
H.	supplementary		
E.	concentric		
D.	60°	**S.**	156°
K.	acute	**N.**	twice
E.	82°	**B.**	41°
T.	98°	**L.**	radius
O.	encircle		

8	13		7	3	6	4		1	5	11		9	12	2	10

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