

Unit VI - Circles

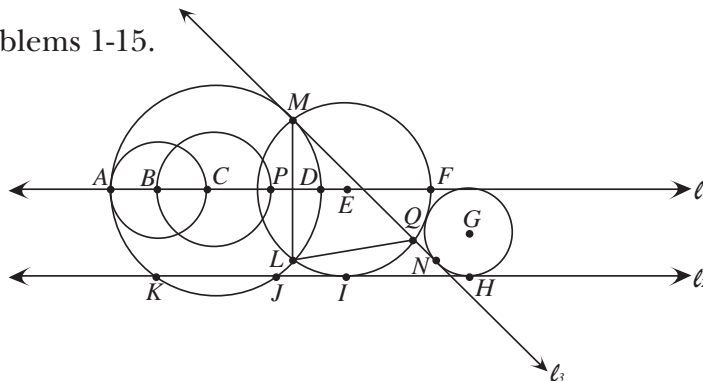
Part A - Fundamental Terms

Lesson 1 - Lines and Segments

Lesson 2 - Arcs and Angles

Lesson 3 - Circle Relationships

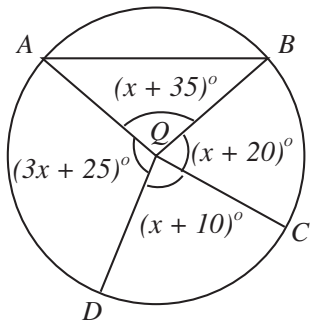
Use the given figure for problems 1-15.



1. l_3 is a _____ tangent of $\odot G$ and $\odot C$. (with diameter \overline{AD})
2. \widehat{KJ} and \widehat{LM} are _____ arcs of $\odot C$.
3. \overline{AD} is a _____ of $\odot C$.
4. $\odot E$ and $\odot G$ are _____ tangent circles.
5. $\odot C$ (with diameter \overline{BP}) and $\odot C$ (with diameter \overline{AD}) are _____ circles.
6. \overline{ML} is a _____ of $\odot E$ and $\odot C$ (with diameter \overline{AD}).
7. l_2 is a common external tangent to \odot _____ and \odot _____.
8. $\triangle MLQ$ is _____ in $\odot E$.
9. l_2 is a _____ of $\odot C$. (with diameter \overline{AD})
10. \widehat{ML} is a _____ arc of $\odot E$.
11. $\odot E$ is _____ about $\triangle MLQ$.
12. \overline{EF} is a _____ of $\odot E$.
13. $\angle MQL$ is an _____ angle of $\odot E$.
14. \widehat{MLQ} is a _____ arc of $\odot E$.
15. \widehat{AKD} is a _____ of $\odot C$ (with diameter \overline{AD}).

—Continued—

Use the given figure for problems 16 - 20. (Note: the open phrases are the measures of the central angles indicated)



16. $x =$ _____

17. $m\widehat{AD} =$ _____

18. $m\widehat{BC} =$ _____

19. $m\widehat{ABC} =$ _____

20. $m\widehat{BCA} =$ _____

21. $m\angle ABQ =$ _____

Unit VI - Circles

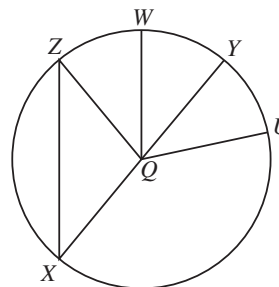
Part A - Fundamental Terms

Lesson 1 - Lines and Segments

Lesson 2 - Arcs and Angles

Lesson 3 - Circle Relationships

Use the given diagram to complete problems 1-18.
 (Note: $m\angle WQY = 30^\circ$, $m\angle UQY = 30^\circ$, $m\angle XQZ = 100^\circ$)



1. Name five central angles which appear to be acute angles. _____
2. Name four central angles which appear to be obtuse angles. _____
3. Name four minor arcs which are not a combination of two arcs. _____
4. Name the largest major arc which is not a combination of more than two arcs. _____
5. Name a semicircle of $\odot Q$. _____
6. Name a pair of congruent arcs. _____
7. Name a pair of congruent chords. _____
8. What is $m\widehat{UY}$? _____
9. What is $m\widehat{ZW}$? _____
10. What is $m\widehat{ZXU}$? _____
11. $m\widehat{WY} + m$ _____ $= m\widehat{YZ}$
12. $m\widehat{XZ} + m$ _____ $= m\widehat{XWU}$
13. \overline{XY} is a _____ of $\odot Q$.
14. \overline{QW} is a _____ of $\odot Q$.
15. \overline{QZ} _____ \overline{QY} .
16. Point X is connected to point Z, so \overline{XZ} is a _____ of $\odot Q$.
17. $\angle ZXY$ is an _____ angle.
18. $\angle XQZ$ is a _____ angle.

—Continued—

19. Sketch two circles that are:

a) concentric

b) internally tangent

c) externally tangent

20. Sketch two circles with a:

a) common internal tangent

b) common external tangent

21. Sketch a circle:

a) circumscribed about a triangle

b) inscribed in a triangle

Unit VI - Circles

Part B - Angle and Arc Relationships

Lesson 1 - Theorem 65 - "If, in the same circle, or in congruent circles, two central angles are congruent, then their intercepted minor arcs are congruent."

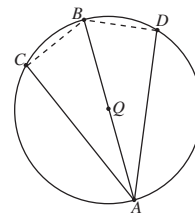
Theorem 66 - "If, in the same circle, or in congruent circles, two minor arcs are congruent, then the central angles which intercept those minor arcs are congruent."

Lesson 2 - Theorem 67 - "If you have an inscribed angle of a circle, then the measure of that angle is one-half the measure of its intercepted arc."

Lesson 3 - Theorem 68 - "If, in a circle, you have an angle formed by a secant ray, and a tangent ray, both drawn from a point on the circle, then the measure of that angle, is one-half the measure of the intercepted arc."

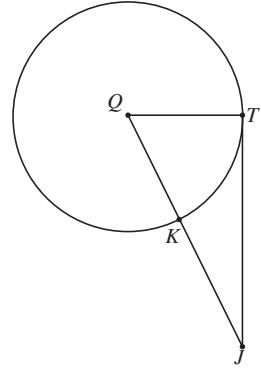
1. Given: \overline{AB} is a diameter of $\odot Q$.
 $\overline{AC} \cong \overline{AD}$

Prove: $\widehat{CB} \cong \widehat{DB}$



—Continued—

2. Use the figure to the right to complete the following statements. In the figure, \overline{JT} is tangent to $\odot Q$ at point T.



a) If $QT = 6$ and $JQ = 10$, then $JT =$ _____

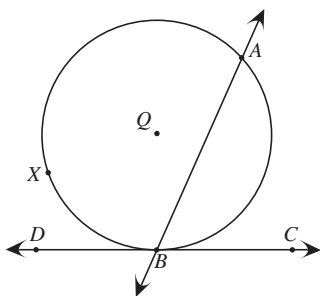
b) If $QT = 8$ and $JT = 15$, then $JQ =$ _____

c) If $m\angle JQT = 60$ and $QT = 6$, then $JQ =$ _____

d) If $JQ = 9$ and $KQ = 8$, then $JT =$ _____

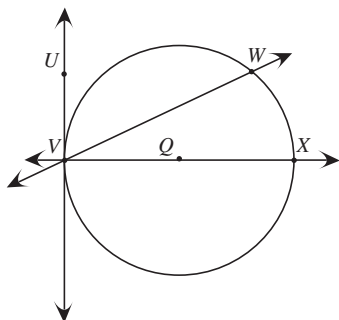
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3.



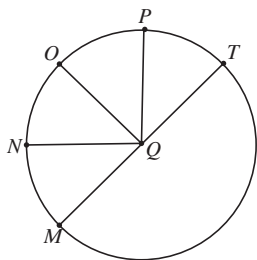
In the figure to the left, if $m\widehat{AXB} = 220$, then $m\angle ABC =$ _____ and $m\angle DBA =$ _____.

4.



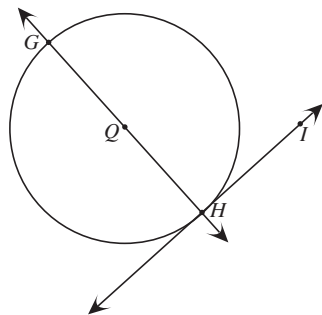
In the figure to the left, if $m\widehat{VW} = 114$, then $m\angle WVX =$ _____ and $m\angle UVW =$ _____.

5.



In the figure to the left, if $m\angle MQN = m\angle TQP = 30$, and $m\widehat{NO} = 60$, then $m\angle NQO =$ _____ and $m\widehat{OP} =$ _____.

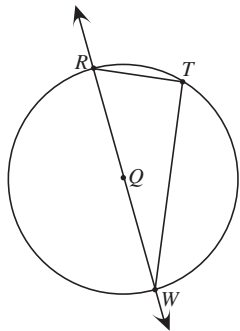
6.



In the figure to the left, if \overleftrightarrow{HI} is tangent to $\odot Q$ at the endpoint H of diameter \overline{GH} , then $m\angle GHI =$ _____

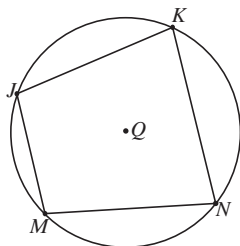
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7.



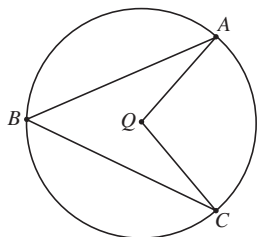
In the figure to the left, if $m\widehat{RT} = 56$, then $m\angle RTW =$ _____, $m\angle RWT =$ _____ and $m\angle TRW =$ _____.

8.



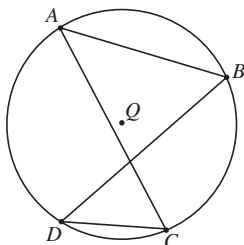
In the figure to the left, if $m\angle J = 105$, and $m\angle K = 80$ then $m\angle M =$ _____ and $m\angle N =$ _____.

9.



In the figure to the left, if $m\angle AQC = 94$, then $m\angle ABC =$ _____ and $m\widehat{AC} =$ _____.

10.



In the figure to the left, if $m\widehat{AD} = 116$, then $m\angle ABD =$ _____ and $m\angle DCA =$ _____.

Unit VI - Circles

Part B - Angle and Arc Relationships

Lesson 1 - Theorem 65 - "If, in the same circle, or in congruent circles, two central angles are congruent, then their intercepted minor arcs are congruent."

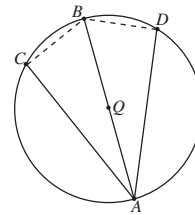
Theorem 66 - "If, in the same circle, or in congruent circles, two minor arcs are congruent, then the central angles which intercept those minor arcs are congruent."

Lesson 2 - Theorem 67 - "If you have an inscribed angle of a circle, then the measure of that angle is one-half the measure of its intercepted arc."

Lesson 3 - Theorem 68 - "If, in a circle, you have an angle formed by a secant ray, and a tangent ray, both drawn from a point on the circle, then the measure of that angle, is one-half the measure of the intercepted arc."

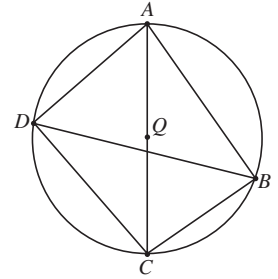
1. Given: \overline{AB} is a diameter of $\odot Q$.
 \overline{AB} bisects \overline{CD}

Prove: $\overline{AC} \cong \overline{AD}$



—Continued—

2. In the figure to the right, quadrilateral ABCD is inscribed in $\odot Q$. Additionally, \overline{AC} is a diameter of $\odot Q$, the $m\angle ABD = 44$, and $m\widehat{AB} = 116$. Use this information for the following:



a) Find $m\angle ABC$ _____

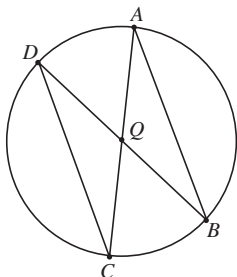
b) Find $m\angle BCA$ _____

c) Find $m\angle CDB$ _____

d) Find $m\angle BAD$ _____

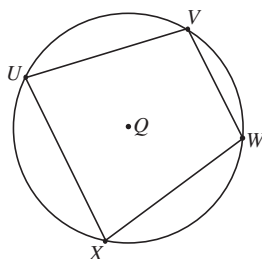
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3.



In the figure to the left, if $m\widehat{AD} = 68$,
then $m\angle ABD =$ _____ and $m\angle ACD =$ _____.

4.



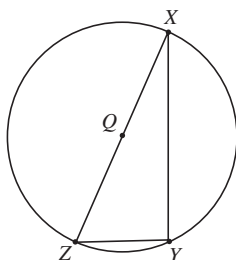
In the figure to the left, if $m\angle V = 94$,
then $m\angle UXW =$ _____.

5.



In the figure to the left, if \overleftrightarrow{DE} is tangent to $\odot Q$ at point E
of diameter \overline{EF} , then $m\angle DEF =$ _____.

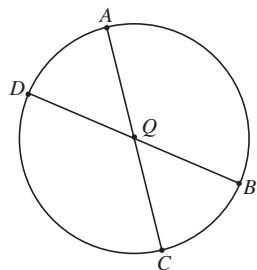
6.



In the figure to the left, if \overline{XZ} is a diameter,
then $m\angle XYZ =$ _____.

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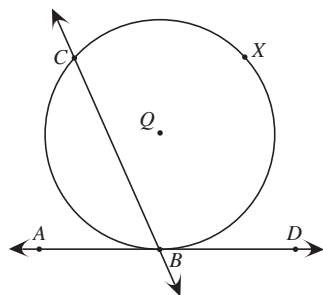
7.



In the figure to the left, if $m\widehat{BC} = 37$,
then $m\widehat{AD} =$ _____.

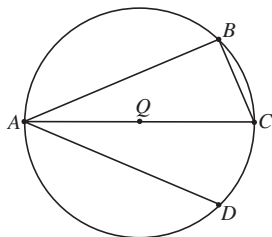
Congruent central angles give congruent intercepted arcs.

8.



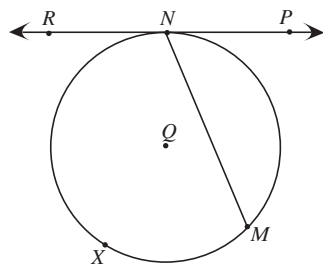
In the figure to the left, if $m\angle ABC = 64$,
then $m\widehat{BXC} =$ _____.

9.



In the figure to the left, if $m\angle BAC = 22$, and $m\widehat{CD} = 44$,
then $m\angle DAC =$ _____, $m\angle ACB =$ _____
and $m\widehat{BC} =$ _____.

10.



In the figure to the left, if $m\widehat{MXN} = 200$,
then $m\angle MNP =$ _____

Unit VI - Circles

Part B - Angle and Arc Relationships

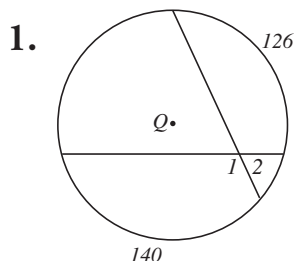
Lesson 4 - Theorem 69 - "If, for a circle, two secant lines intersect inside the circle, then the measure of an angle formed by the two secant lines, (or its vertical angle) is equal to one-half the sum of the measures of the arcs intercepted by the angle, and its vertical angle."

Theorem 70 - "If, for a circle, two secant lines intersect outside the circle, then the measure of an angle formed by the two secant lines, (or its vertical angle), is equal to one-half the difference of the measures of the arcs intercepted by the angle."

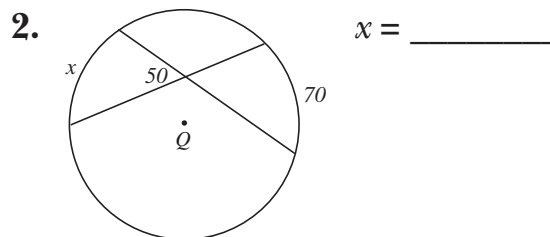
Lesson 5 - Theorem 71 - "If, for a circle, a secant line and a tangent line intersect outside a circle, then the measure of the angle formed, is equal to one-half the difference of the measures of the arcs intercepted by the angle."

Theorem 72 - "If, for a circle, two tangent lines intersect outside the circle, then the measure of the angle formed, is equal to one-half the difference of the measures of the arcs intercepted by the angle."

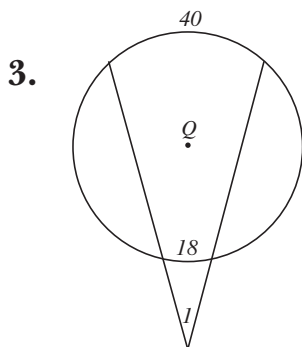
In problems 1-10, find the measure of each numbered angle or lettered arc in $\odot Q$.



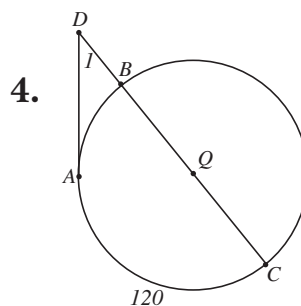
$m\angle 1 = \underline{\hspace{2cm}}$
 $m\angle 2 = \underline{\hspace{2cm}}$



$x = \underline{\hspace{2cm}}$



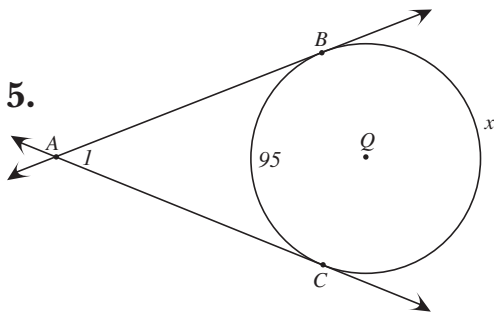
$m\angle 1 = \underline{\hspace{2cm}}$



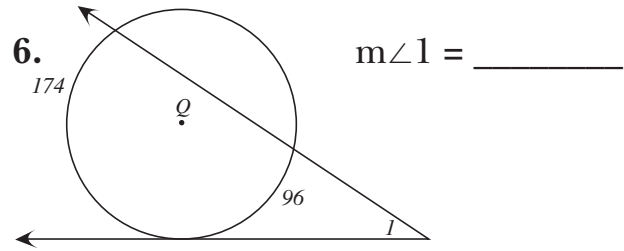
$m\angle 1 = \underline{\hspace{2cm}}$

Unit VI, Part B, Lessons 4&5, Quiz Form A
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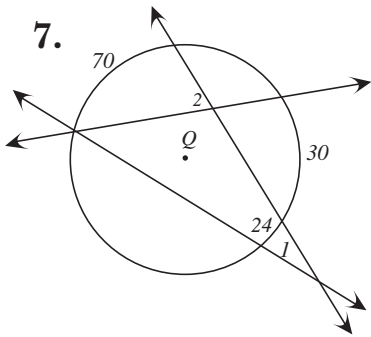
Name _____



$m\angle 1 = \underline{\hspace{2cm}}$

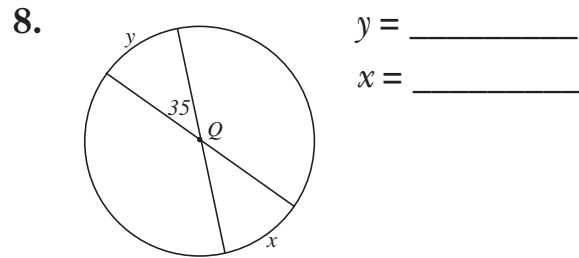


$m\angle 1 = \underline{\hspace{2cm}}$



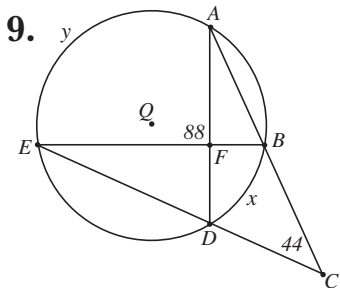
$m\angle 1 = \underline{\hspace{2cm}}$

$m\angle 2 = \underline{\hspace{2cm}}$



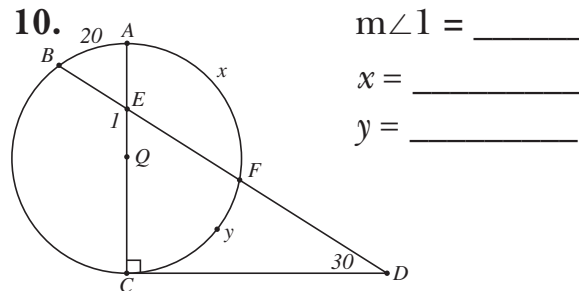
$y = \underline{\hspace{2cm}}$

$x = \underline{\hspace{2cm}}$



$x = \underline{\hspace{2cm}}$

$y = \underline{\hspace{2cm}}$



$m\angle 1 = \underline{\hspace{2cm}}$

$x = \underline{\hspace{2cm}}$

$y = \underline{\hspace{2cm}}$

In problems 11-14, determine which statements are true and which are false.

- 11.** No tangents of a circle are secants of that circle. _____
- 12.** A point of tangency is outside the circle. _____
- 13.** If a line contains a point inside a circle, it is a secant of that circle. _____
- 14.** From a given point, there is only one tangent to a given circle. _____

Unit VI - Circles

Part B - Angle and Arc Relationships

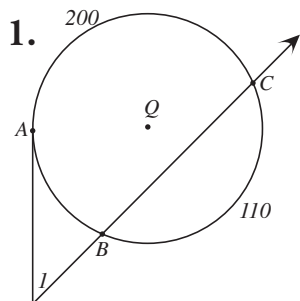
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Theorem 70 - "If, for a circle, two secant lines intersect outside the circle, then the measure of an angle formed by the two secant lines, (or its vertical angle), is equal to one-half the difference of the measures of the arcs intercepted by the angle."

Lesson 5 - Theorem 71 - "If, for a circle, a secant line and a tangent line intersect outside a circle, then the measure of the angle formed, is equal to one-half the difference of the measures of the arcs intercepted by the angle."

Theorem 72 - "If, for a circle, two tangent lines intersect outside the circle, then the measure of the angle formed, is equal to one-half the difference of the measures of the arcs intercepted by the angle."

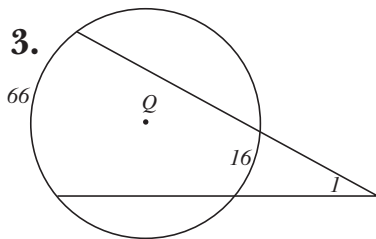
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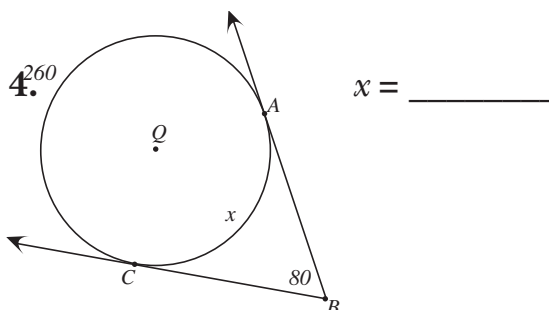
$m\angle 1 = \underline{\hspace{2cm}}$

2.

$m\angle 1 = \underline{\hspace{2cm}}$



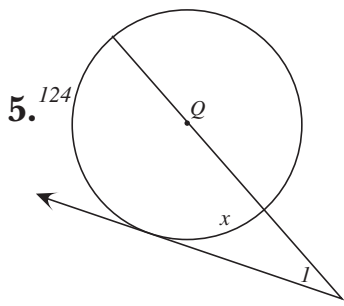
$m\angle 1 = \underline{\hspace{2cm}}$



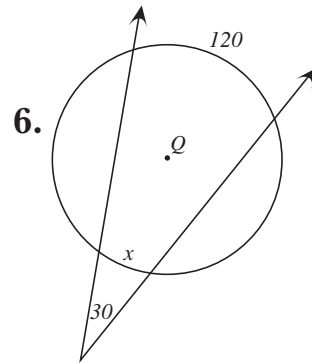
$x = \underline{\hspace{2cm}}$

Unit VI, Part B, Lessons 4&5, Quiz Form B
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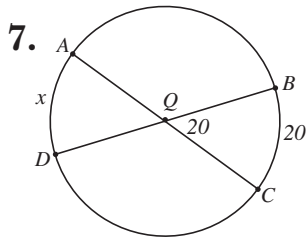
Name _____



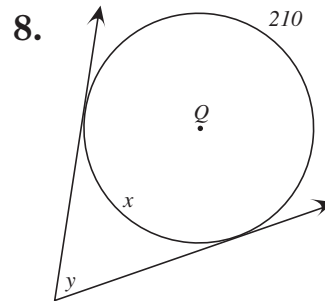
$m\angle l =$ _____
 $x =$ _____



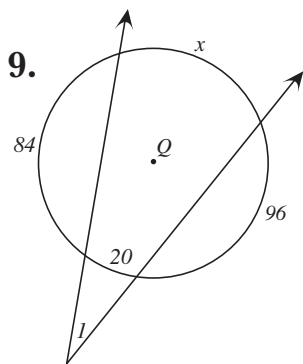
$x =$ _____



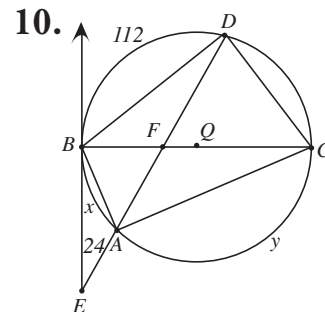
$x =$ _____



$y =$ _____
 $x =$ _____



$m\angle l =$ _____
 $x =$ _____



$x =$ _____
 $y =$ _____
 $m\angle DFC =$ _____

—Continued—

In problems 11-14, determine which statements are true and which are false.

11. A secant of a circle has two points of tangency on the circle. _____
12. If \overleftrightarrow{AB} and \overleftrightarrow{AC} are tangent to circle Q , then $AB = AC$. _____
13. For a given circle, the distance between a point of tangency and the center of the circle equals the radius. _____
14. If the intersection of a line and a circle consists of two points, the line is a tangent of the circle. _____