Geometry - Chapter 12 Test SAMPLE

Multiple Choice
Identify the choice that best completes the statement or answers the question.

Find the value of $x$. If necessary, round your answer to the nearest tenth. The figure is not drawn to scale.

1. \[ \begin{array}{l}
\text{a. } 19.34 \\
\text{b. } 10.49 \\
\text{c. } 110 \\
\text{d. } 9.22 \\
\end{array} \]

2. The circles are congruent. What can you conclude from the diagram?

\[ \begin{array}{l}
\text{a. } \text{arc } CAB \cong \text{arc } FDE \\
\text{b. } \text{arc } DF \cong \text{arc } AC \\
\text{c. } \text{arc } AB \cong \text{arc } DE \\
\text{d. } \text{none of these} \\
\end{array} \]
3. Write the standard equation of the circle in the graph.

\[ (x + 3)^2 + (y - 2)^2 = 9 \]
\[ (x - 3)^2 + (y + 2)^2 = 9 \]
\[ (x - 3)^2 + (y + 2)^2 = 18 \]
\[ (x + 3)^2 + (y - 2)^2 = 18 \]

Short Answer

Assume that lines that appear to be tangent are tangent. \( O \) is the center of the circle. Find the value of \( x \). (Figures are not drawn to scale.)

4. \( m\angle O = 111 \)

5. \( m\angle P = 12 \)
6. \( BC \) is tangent to circle \( A \) at \( B \) and to circle \( D \) at \( C \) (not drawn to scale).\n\( AB = 7, BC = 18, \) and \( DC = 5 \). Find \( AD \) to the nearest tenth.

\[ \text{Diagram of circles with tangents} \]

7. \( AB \) is tangent to circle \( O \) at \( B \). Find the length of the radius \( r \) for \( AB = 5 \) and \( AO = 8.6 \). Round to the nearest tenth if necessary. The diagram is not to scale.

\[ \text{Diagram of circle with tangent line} \]

8. A chain fits tightly around two gears as shown. The distance between the centers of the gears is 20 inches. The radius of the larger gear is 11 inches. Find the radius of the smaller gear. Round your answer to the nearest tenth, if necessary. The diagram is not to scale.

\[ \text{Diagram of gears with chain} \]
9. \(\overline{JK}, \overline{KL},\) and \(\overline{LJ}\) are all tangent to \(O\) (not drawn to scale). \(JA = 9, AL = 10,\) and \(CK = 14.\) Find the perimeter of \(\triangle JKL.\)

10. Pentagon \(RSTUV\) is circumscribed about a circle. Solve for \(x\) for \(RS = 10, ST = 13,\) \(TU = 11, UV = 12,\) and \(VR = 12.\) The figure is not drawn to scale.
In the figure, $\overrightarrow{PA}$ and $\overrightarrow{PB}$ are tangent to circle $O$ and $\overrightarrow{PD}$ bisects $\angle BPA$. The figure is not drawn to scale.

11. For $m\angle AOC = 46$, find $m\angle POB$.

12. For $m\angle AOC = 50$, find $m\angle BPO$.

Find the value of $x$. If necessary, round your answer to the nearest tenth. The figure is not drawn to scale.

13. $\overrightarrow{FG} \perp \overrightarrow{OP}$, $\overrightarrow{RS} \perp \overrightarrow{OQ}$, $FG = 40$, $RS = 37$, $OP = 19$
14. $\overline{NA} \cong \overline{PA}$, $\overline{MO} \perp \overline{NA}$, $\overline{RO} \perp \overline{PA}$, $MN = 6$ feet

15.

16.
17.

18. The figure consists of a chord, a secant and a tangent to the circle. Round to the nearest hundredth, if necessary.

19. $AB = 20$, $BC = 6$, and $CD = 8$
20. $\overline{WZ}$ and $\overline{XR}$ are diameters. Find the measure of arc $ZWX$. (The figure is not drawn to scale.)

Use the diagram. $\overline{AB}$ is a diameter, and $\overline{AB} \perp \overline{CD}$. The figure is not drawn to scale.

21. Find $m\angle CAP$ for $m\angle CBD = 66$.

22. Find $m(\text{arc } BD)$ for $m(\text{arc } AC) = 43$. 
23. The radius of circle $O$ is 18, and $OC = 13$. Find $AB$. Round to the nearest tenth, if necessary. (The figure is not drawn to scale.)

24. If $m(\text{arc } BY) = 40$, what is $m\angle YAC$? (The figure is not drawn to scale.)

25. $m(\text{arc } DE) = 96$ and $m(\text{arc } BC) = 67$. Find $m\angle A$. (The figure is not drawn to scale.)
26. Find the value of $x$ for $m(\text{arc } AB) = 46$ and $m(\text{arc } CD) = 25$. (The figure is not drawn to scale.)

27. Find $AB$. Round to the nearest tenth if necessary.

28. Write the standard equation for the circle.
   center $(2, 7)$, $r = 4$

29. center $(-6, -8)$, that passes through $(0, 0)$

30. Find the center and radius of the circle with equation $(x + 9)^2 + (y + 5)^2 = 64$. 

Write the standard equation for the circle.

28. center $(2, 7), r = 4$

29. center $(-6, -8)$, that passes through $(0, 0)$

30. Find the center and radius of the circle with equation $(x + 9)^2 + (y + 5)^2 = 64$. 

Write the standard equation for the circle.
Geometry - Chapter 12 Test SAMPLE
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS: 1  DIF: L2  REF: 12-4 Angle Measures and Segment Lengths  OBJ: 12-4.2 Finding Segment Lengths  STA: CA GEOM 2.0| CA GEOM 7.0| CA GEOM 21.0  TOP: 12-4 Example 3  KEY: segment length | tangent | secant

2. ANS: C  PTS: 1  DIF: L2  REF: 12-2 Chords and Arcs  OBJ: 12-2.1 Using Congruent Chords, Arcs, and Central Angles  STA: CA GEOM 2.0| CA GEOM 7.0| CA GEOM 21.0  TOP: 12-2 Example 1  KEY: arc | central angle | congruent circles

3. ANS: B  PTS: 1  DIF: L2  REF: 12-5 Circles in the Coordinate Plane  OBJ: 12-5.2 Finding the Center and Radius of a Circle  STA: CA GEOM 7.0| CA GEOM 17.0  TOP: 12-4 Example 4  KEY: center | circle | coordinate plane | radius | equation of a circle

SHORT ANSWER

4. ANS:
   69
   PTS: 1  DIF: L2  REF: 12-1 Tangent Lines  OBJ: 12-1.1 Using the Radius-Tangent Relationship  STA: CA GEOM 7.0| CA GEOM 21.0  TOP: 12-1 Example 1  KEY: tangent to a circle | point of tangency | properties of tangents | central angle

5. ANS:
   78
   PTS: 1  DIF: L2  REF: 12-1 Tangent Lines  OBJ: 12-1.1 Using the Radius-Tangent Relationship  STA: CA GEOM 7.0| CA GEOM 21.0  TOP: 12-1 Example 1  KEY: tangent to a circle | point of tangency | angle measure | properties of tangents | central angle

6. ANS:
   18.1
   PTS: 1  DIF: L2  REF: 12-1 Tangent Lines  OBJ: 12-1.1 Using the Radius-Tangent Relationship  STA: CA GEOM 7.0| CA GEOM 21.0  TOP: 12-1 Example 2  KEY: tangent to a circle | point of tangency | properties of tangents | Pythagorean Theorem
7. ANS: 
7

PTS: 1  DIF: L2  REF: 12-1 Tangent Lines  
OBJ: 12-1.1 Using the Radius-Tangent Relationship  STA: CA GEOM 7.0| CA GEOM 21.0  
TOP: 12-1 Example 3  
KEY: tangent to a circle | point of tangency | properties of tangents | right triangle | Pythagorean Theorem

8. ANS: 
4.8 inches

PTS: 1  DIF: L2  REF: 12-1 Tangent Lines  
OBJ: 12-1.1 Using the Radius-Tangent Relationship  STA: CA GEOM 7.0| CA GEOM 21.0  
TOP: 12-1 Example 2  
KEY: word problem | tangent to a circle | point of tangency | properties of tangents | right triangle | Pythagorean Theorem

9. ANS: 
66

PTS: 1  DIF: L2  REF: 12-1 Tangent Lines  
OBJ: 12-1.2 Using Multiple Tangents  STA: CA GEOM 7.0| CA GEOM 21.0  
TOP: 12-1 Example 5  
KEY: properties of tangents | tangent to a circle | triangle

10. ANS: 
4

PTS: 1  DIF: L3  REF: 12-1 Tangent Lines  
OBJ: 12-1.2 Using Multiple Tangents  STA: CA GEOM 7.0| CA GEOM 21.0  
TOP: 12-1 Example 5  
KEY: properties of tangents | tangent to a circle | pentagon

11. ANS: 
46

PTS: 1  DIF: L2  REF: 12-1 Tangent Lines  
OBJ: 12-1.2 Using Multiple Tangents  STA: CA GEOM 7.0| CA GEOM 21.0  
TOP: 12-1 Example 4  
KEY: properties of tangents | tangent to a circle | Tangent Theorem

12. ANS: 
40

PTS: 1  DIF: L2  REF: 12-1 Tangent Lines  
OBJ: 12-1.2 Using Multiple Tangents  STA: CA GEOM 7.0| CA GEOM 21.0  
TOP: 12-1 Example 4  
KEY: properties of tangents | tangent to a circle | Tangent Theorem

13. ANS: 
20.5

PTS: 1  DIF: L3  REF: 12-2 Chords and Arcs  
OBJ: 12-2.1 Using Congruent Chords, Arcs, and Central Angles  
STA: CA GEOM 2.0| CA GEOM 7.0| CA GEOM 21.0  
TOP: 12-2 Example 3  
KEY: circle | radius | chord | congruent chords | right triangle | Pythagorean Theorem
14. ANS:
3 ft

PTS: 1  DIF: L2  REF: 12-2 Chords and Arcs
OBJ: 12-2.1 Using Congruent Chords, Arcs, and Central Angles
STA: CA GEOM 2.0l CA GEOM 7.0l CA GEOM 21.0  TOP: 12-2 Example 2
KEY: circle | radius | chord | congruent chords | bisected chords

15. ANS:
77

PTS: 1  DIF: L2  REF: 12-2 Chords and Arcs
OBJ: 12-2.1 Using Congruent Chords, Arcs, and Central Angles
STA: CA GEOM 2.0l CA GEOM 7.0l CA GEOM 21.0  TOP: 12-2 Example 1
KEY: arc | central angle | congruent arcs

16. ANS:
10

PTS: 1  DIF: L2  REF: 12-2 Chords and Arcs
OBJ: 12-2.2 Lines Through the Center of a Circle
STA: CA GEOM 2.0l CA GEOM 7.0l CA GEOM 21.0  TOP: 12-2 Example 3
KEY: bisected chords | circle | perpendicular | perpendicular bisector | Pythagorean Theorem

17. ANS:
12

PTS: 1  DIF: L2  REF: 12-4 Angle Measures and Segment Lengths
OBJ: 12-4.2 Finding Segment Lengths
STA: CA GEOM 2.0l CA GEOM 7.0l CA GEOM 21.0
TOP: 12-4 Example 3
KEY: circle | chord | intersection inside the circle

18. ANS:
15.75

PTS: 1  DIF: L3  REF: 12-4 Angle Measures and Segment Lengths
OBJ: 12-4.2 Finding Segment Lengths
STA: CA GEOM 2.0l CA GEOM 7.0l CA GEOM 21.0
KEY: circle | chord | intersection inside the circle | intersection outside the circle | secant | tangent to a circle

19. ANS:
11.5

PTS: 1  DIF: L2  REF: 12-4 Angle Measures and Segment Lengths
OBJ: 12-4.2 Finding Segment Lengths
STA: CA GEOM 2.0l CA GEOM 7.0l CA GEOM 21.0
TOP: 12-4 Example 3
KEY: circle | intersection outside the circle | secant

20. ANS:
226

PTS: 1  DIF: L2  REF: 12-2 Chords and Arcs
OBJ: 12-2.1 Using Congruent Chords, Arcs, and Central Angles
STA: CA GEOM 2.0l CA GEOM 7.0l CA GEOM 21.0  TOP: 12-2 Example 1
KEY: arc | central angle | congruent arcs | arc measure | arc addition | diameter

3
21. ANS: 57

PTS: 1  DIF: L3  REF: 12-2 Chords and Arcs
OBJ: 12-2.2 Lines Through the Center of a Circle
STA: CA GEOM 2.0| CA GEOM 7.0| CA GEOM 21.0
KEY: diameter | chord | perpendicular | angle measure | circle | right triangle

22. ANS: 137°

PTS: 1  DIF: L3  REF: 12-2 Chords and Arcs
OBJ: 12-2.2 Lines Through the Center of a Circle
STA: CA GEOM 2.0| CA GEOM 7.0| CA GEOM 21.0
KEY: arc | chord-arc relationship | diameter | chord | perpendicular | angle measure | circle | right triangle | perpendicular bisector

23. ANS: 24.9

PTS: 1  DIF: L2  REF: 12-2 Chords and Arcs
OBJ: 12-2.2 Lines Through the Center of a Circle
STA: CA GEOM 2.0| CA GEOM 7.0| CA GEOM 21.0
KEY: bisected chords | circle | perpendicular | perpendicular bisector | Pythagorean Theorem

24. ANS: 70

PTS: 1  DIF: L2  REF: 12-3 Inscribed Angles
OBJ: 12-3.2 The Angle Formed by a Tangent and a Chord
STA: CA GEOM 2.0| CA GEOM 7.0| CA GEOM 21.0
KEY: circle | inscribed angle | tangent-chord angle | intercepted arc | arc measure | angle measure

25. ANS: 14.5

PTS: 1  DIF: L2  REF: 12-4 Angle Measures and Segment Lengths
OBJ: 12-4.1 Finding Angle Measures
STA: CA GEOM 2.0| CA GEOM 7.0| CA GEOM 21.0
TOP: 12-4 Example 1
KEY: circle | secant | angle measure | arc measure | intersection outside the circle

26. ANS: 35.5°

PTS: 1  DIF: L2  REF: 12-4 Angle Measures and Segment Lengths
OBJ: 12-4.1 Finding Angle Measures
STA: CA GEOM 2.0| CA GEOM 7.0| CA GEOM 21.0
TOP: 12-4 Example 1
KEY: circle | secant | angle measure | arc measure | intersection inside the circle
27. ANS:
3.5

PTS: 1 DIF: L3 REF: 12-4 Angle Measures and Segment Lengths
OBJ: 12-4.2 Finding Segment Lengths STA: CA GEOM 2.0| CA GEOM 7.0| CA GEOM 21.0
TOP: 12-4 Example 3 KEY: circle | intersection outside the circle | secant | tangent

28. ANS:
\((x - 2)^2 + (y - 7)^2 = 16\)

PTS: 1 DIF: L2 REF: 12-5 Circles in the Coordinate Plane
OBJ: 12-5.1 Writing an Equation of a Circle STA: CA GEOM 7.0| CA GEOM 17.0
TOP: 12-5 Example 1 KEY: equation of a circle | center | radius

29. ANS:
\((x + 6)^2 + (y + 8)^2 = 100\)

PTS: 1 DIF: L2 REF: 12-5 Circles in the Coordinate Plane
OBJ: 12-5.1 Writing an Equation of a Circle STA: CA GEOM 7.0| CA GEOM 17.0
TOP: 12-5 Example 2 KEY: equation of a circle | center | radius | point on the circle

30. ANS:
center \((-9, -5)\); \(r = 8\)

PTS: 1 DIF: L2 REF: 12-5 Circles in the Coordinate Plane
OBJ: 12-5.2 Finding the Center and Radius of a Circle STA: CA GEOM 7.0| CA GEOM 17.0
TOP: 12-5 Example 3 KEY: center | circle | coordinate plane | radius