Show all work for full credit.

Circles -- FSA

1. Given: In \( \odot O \), \( \angle BAC = 290^\circ \). Find \( \angle B \).

2. Write the standard equation of a circle with center \((-3, -4)\) and radius 6.

3. \( m\overline{AB} = 82^\circ \), \( m\overline{CD} = 30^\circ \)
   Find \( m\angle DOC \).

4. Given: \( m\angle X = 110^\circ \); \( \overline{WZ} \cong \overline{YZ} \); \( m\angle Y = 100^\circ \)

Refer to the diagram to find the measure of each of the following:
   a. \( \angle Z \)  
   b. \( \overline{WZ} \)  
   c. \( \angle W \)  
   d. \( \overline{WX} \)

5. What must be the measures of \( \angle B \) and \( \angle C \) so that a circle can be circumscribed about \( ABCD \)?

6. Given \( RP = 22 \), \( RA = 6 \), and \( \overline{PQ} \) is tangent to \( \odot R \) at \( Q \), find \( PQ \).

7. In \( \odot D \), \( AB \cong CB \) and \( m \text{ arc } CE = 50 \). Find \( m\angle BCE \).

8. Find the measure of \( \angle 1 \).

9. Suppose you stand at a distance from a circular building. Assuming your lines of sight form tangents to the building and make an angle of \( 22^\circ \), what is the measure of the arc of the building that your lines of sight intersect?
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10 In $\odot F$, $\angle CFD \cong \angle DFE$, $m\angle BFA = 7x$, $m\angle AFE = 5x + 12$, and $BE$ and $AC$ are diameters. Find $m\angle DC$.

11 $\overrightarrow{AB}$ and $\overrightarrow{AG}$ are tangent to the circle, $m\angle A = 30^\circ$, and $m\angle DE = 50^\circ$. What is $m\angle BFG$?

12 Find the value of $x$.

13 Find the measure of the numbered angle.

14 $\overline{AB}$ is tangent to $\odot O$ at $A$ (not drawn to scale). Find the length of the radius $r$, to the nearest tenth.

15 $m\angle BCD = 114^\circ$, $m\angle DEF = 94^\circ$, $m\angle FGH = 136^\circ$, and $m\angle HAB = 16^\circ$. Find $m\angle FPD$.

16 Find $x$. Assume that any segment that appears to be tangent is tangent.

17 The figure represents a Japanese fan of 29 cm radius. Find the length of the $\overline{AB}$.
18. Find the value of \( m\angle BOC \) if \( m\widehat{AB} = 20^\circ \) and \( m\widehat{CD} = 62^\circ \).

![Diagram of a circle with points A, B, O, C, and D.]

19. How many degrees does a minute hand move in 35 minutes?

![Diagram of a clock face showing 35 minutes past an hour.]

20. A park maintenance person stands 15 m from a circular monument. If you draw two tangents from the maintenance person to each side of the monument, they make an angle of 37°. What is the measure of the arc created where the lines intersect the monument?

21. Find the value of \( x \) to the nearest tenth.

![Diagram of a circle with central angles and \( 270^\circ \).]

22. Find the area of the shaded region. Round answers to the nearest tenth. Assume all inscribed polygons are regular.

![Diagram of a circle with a shaded triangle and a sector.]

23. Given that \( \angle DAB \) and \( \angle DCB \) are right angles and \( m\angle DBC = 42^\circ \), what is the measure of \( \overparen{CAB} \)?

![Diagram of a circle with points A, B, C, D, and E.]

24. A hummingbird is flying toward a large tree that has a radius of 6 feet. When it is 31 feet from the center of the tree, its lines of sight form two tangents. What is the measure of the arc on the tree that the hummingbird can see?
Show all work for full credit.

25 Find the area of the shaded region. Round answers to the nearest tenth. Assume all inscribed polygons are regular.

26 Find the value of x.

27 If \( m\angle G = 25^\circ \), \( m\angle H = 20^\circ \), and \( m\angle K = 50^\circ \), what is \( m\angle GMH \)?

28 In \( \odot C \), the diameter is 42 units long, and, \( m\angle CRT = 30^\circ \). Find x.

29 A wooden wagon wheel has 12 equally spaced spokes radiating from the central hub.

What is the measure of the angle that determines the separation between two adjacent spoke holes?

30 In \( \odot A \), \( \overline{AC} \cong \overline{AF} \) and AE = 10.

Find \( m\overline{EG} \).

31 A footbridge is in the shape of an arc of a circle. The bridge is 7 ft tall and 23 ft long, horizontally. What is the radius of the circle that contains the bridge? Round your answer to the nearest tenth.

A. 25.9 ft  
B. 5.9 ft  
C. 18.9 ft  
D. 12.9 ft

32 The standard equation of a circle with center \((-4, 3)\) and radius 7 is _____.

33 If \( m\angle 1 = 2x + 2 \), \( m\angle 2 = 9x \), find \( m\angle 1 \).