**SM2H 6.2 Inscribed Angles, Chord, Tangent and Secant Theorems**

Complete the statement.

1. **A(n) __________________angle is an angle whose vertex is on a circle and whose sides contain chords of the circle.**

2. If an angle is inscribed in a circle, then its measure is _________ the measure of its intercepted arc.

3. If a triangle inscribed in a circle is a right triangle, then the hypotenuse is a ___________ of the circle.

4. If a quadrilateral can be inscribed in a circle, then its ______________angles are supplementary.

Find the value of $x$.

5. \[ x = \]

6. \[ x = \]

7. \[ x = \]

8. \[ x = \]

9. \[ x = \]

10. \[ x = \]

Why?

Why?

Why?
11. \[ x = \]

12. \[ x = \]

13. \[ x = \]

Why?

14. Prove that radius \( AB \perp AC \) using the Pythagorean Theorem.

In the picture below, two chopsticks form \( \angle ABC \) on a circular plate.

15. If \( m \angle ABC = 54^\circ \), find the \( m \widehat{AC} \)

16. \( m \widehat{AC} = 106^\circ \) and \( m \angle ABC = (3x + 8)^\circ \), find the value of \( x \)
Find the measure of the indicated arc or angle.

17. \( x = \)
   Why?

18. \( x = \)
   Why?

19. \( x = \)

20. \( x = \)

21. \( x = \)

22. \( x = \)

23. \( x = \)
   Why?

24. \( x = \)
25. \( x = \) [Diagram of a circle with central angles and arc measures]

26. \( x = \) [Diagram of a circle with central angles and arc measures]

Complete the statement.

27. If a diameter of a circle is \underline{bisects} to a chord, then the diameter bisects the chord and its arc.

28. If one chord is a perpendicular bisector of another chord, then the first chord is a \underline{perpendicular bisector}.

29. In the same circle, or congruent circles, if two chords are congruent, then their corresponding minor arcs are \underline{congruent}.

30. If two minor arcs of a circle are congruent, then their corresponding \underline{chords} are congruent.

Determine whether \( \overline{AB} \) is a diameter of the circle. \underline{Explain your reasoning}.

31. \( A \), \( B \), \( C \), \( D \) [Diagram of a circle with labeled points]

32. \( A \), \( B \), \( C \), \( D \) [Diagram of a circle with labeled points]

33. \( A \), \( B \), \( C \), \( D \) [Diagram of a circle with labeled points]

Find the value of \( x \).

34. \( x + 1 \), \( 2x - 3 \) \[Diagram of a circle with labeled central angles and algebraic expressions involving \( x \)]

35. \( 3x - 5 \), \( x + 1 \) [Diagram of a circle with labeled central angles and algebraic expressions involving \( x \)]

36. \( 5x^\circ \), \( 60^\circ \) [Diagram of a circle with labeled central angles and algebraic expressions involving \( x \)]

\( x = \) \( x = \) \( x = \)

Name any congruent arcs or chords. \underline{State a theorem that justifies your answer}.

37. \( W \), \( Y \), \( X \) [Diagram of a circle with labeled points and arcs]

38. \( J \), \( K \), \( L \), \( M \) [Diagram of a circle with labeled points and arcs]

39. \( D \), \( B \), \( F \) [Diagram of a circle with labeled points and arcs]
Use the following diagram to answer questions 40-42. The circular button shown has chords $\overline{AB}$ and $\overline{CE}$. $\overline{AB} \perp \overline{CE}$ and $\overline{CD} \cong \overline{DE}$.

40. Identify a diameter of the circle.

41. Is $\overline{CE}$ a diameter of the circle? Explain.

42. Name a pair of congruent arcs.

**Complete the statement.**

43. If two chords intersect inside a circle, then the measure of each angle formed is one half the _________ of the measures of the arcs intercepted by the angle and its vertical angle.

44. If two chords intersect inside a circle, then the _______ of the lengths of the segments of one chord is equal to the _______ of the lengths of the segments of the other chord.

**Find the measure of $\angle 1$.**

45. $m\angle 1 = \ ?$

46. $m\angle 1 = \ ?$

47. $m\angle 1 = \ ?$

Find the value of $x$.

48. $x = \ ?$

49. $x = \ ?$

50. $x = \ ?$

51. $x = \ ?$

52. $x = \ ?$

53. $x = \ ?$
Find the value of \( x \). Assume lines that appear tangent are tangent. Show all work.

54. \( x = \)

55. \( x = \)

56. \( x = \)

57. \( x = \)

58. \( x = \)

59. \( x = \)

60. \( x = \)

61. \( x = \)

62. \( x = \)

63. \( x = \)

64. \( x = \)