Practice Problems: 10.1 Tangents and Chords

Match the notation with the term that best describes it.

A. Center
B. Chord
C. Diameter
D. Radius
E. Point of Tangency
F. Common External Tangent
G. Common Internal Tangent
H. Secant

Use the diagram at the right.

9. What are the diameter and radius of \( \odot A \)?
   \[ d = 4 \quad r = 2 \]
10. What are the diameter and radius of \( \odot B \)?
    \[ d = 4 \quad r = 2 \]
11. Describe the intersection of the two circles.
    touch at 1 point of tangency
12. Describe all the common tangents of the two circles.
    3 tangent lines, are internal and two external

Use \( \odot P \) to draw part of the circle described to answer the question.

13. Draw a diameter \( \overline{AB} \).
14. Draw tangent line \( \overline{CB} \).
15. Draw chord \( \overline{DB} \).
16. Draw a secant through point A.
17. What is the name of a radius in the figure?
   \( \overline{AP} \) or \( \overline{PB} \)

Tell how many common tangents the circles have and draw them.

18. 
19. 
20.
Draw two circles with the given number of common tangents.

21. 3

22. 2

23. 1

In the diagram, \(BC\) is a radius of \(\odot C\). Determine whether \(AB\) is tangent to \(\odot C\). Explain your reasoning.

24. \(AB\) is tangent to \(\odot C\) because it is \(\perp\) to the radius.

\[
X^2 + 96^2 = 100^2
\]
\[
x^2 + 9216 = 10000
\]
\[
\frac{\sqrt{x^2}}{2} = 784
\]
\[
x = 28
\]

25. \(AB\) is tangent to \(\odot C\) because \(45^2 + 108^2 = x^2\) it is \(\perp\) to the radius.

\[
\frac{\sqrt{13689}}{3} = x^2
\]
\[
x = 117
\]

In the diagram, \(AB\) is tangent to \(\odot C\) at point B. Find the radius \(r\) of \(\odot C\).

26. \[
X^2 + 32^2 = (x+16)^2
\]
\[
x^2 + 1024 = x^2 + 32x + 256
\]
\[
768 = 32x
\]
\[
x = \frac{768}{32}
\]
\[
x = 24
\]

Radius = 24

27. \[
X^2 + 56^2 = (x+32)^2
\]
\[
x^2 + 3136 = x^2 + 64x + 1024
\]
\[
2112 = 64x
\]
\[
x = 33
\]

\[
\text{Radius = 33}
\]

28. \[
4x + 7 = 7x - 8
\]
\[
15 = 3x
\]
\[
x = 5
\]

29. \[
3x^2 - 10 = 17
\]
\[
x = 3
\]

30. Softball On a softball field, home plate is 38 feet from the pitching circle. Home plate is about 45.3 feet from a point of tangency on the circle.

a. How far is it from home plate to a point of tangency on the other side of the pitching circle?

\[
x = 45.3 - 38
\]

\[
x = 7.3 \text{ ft}
\]

They are equal measures.

b. What is the radius of the pitching circle?

\[
r^2 + (45.3)^2 = (r+38)^2
\]
\[
x^2 + 2052.09 = x^2 + 76r + 1444
\]

\[
\frac{x}{2} + 2052.09 = x + 76r + 1444
\]
Practice Problems: 10.7 Equation of a Circle

Match the equation of a circle with its description

1. \( x^2 + y^2 = 4 \)  
   - A. Center (-1,4), radius 4
2. \( x^2 + y^2 = 9 \)  
   - B. Center (-2,-3), radius 3
3. \( (x+1)^2 = (y-4)^2 = 16 \)  
   - C. Center (0,0), radius 2
4. \( (x+2)^2 + (y+3)^2 = 9 \)  
   - D. Center (2,5), radius 3
5. \( (x+3)^2 + (y-5)^2 = 16 \)  
   - E. Center (-3,5), radius 4
6. \( (x-2)^2 + (y-5)^2 = 9 \)  
   - F. Center (0,0), radius 3

Give the center and radius of the circle.

7. \( x^2 + (y-4)^2 = 9 \)  
   - Center: (0,4)  
   - Radius: 3
8. \( (x+1)^2 + (y-1)^2 = 4 \)  
   - Center: (-1,1)  
   - Radius: 2

Write the standard equation of the circle.

9. \[ x^2 + y^2 = 3^2 \]

10. \[ x^2 + y^2 = 2^2 \]

Write the standard equation of the circle with given center and radius.

11. Center (2,0), radius 3
    \[ (x-2)^2 + y^2 = 9 \]
12. Center(5,-6), radius 1
    \[ (x-5)^2 + (y+6)^2 = 1 \]

Use the given information to write the standard equation of the circle.

13. The center is (-1, 2), and a point on the circle is (2, 6).
    \[ r = \sqrt{(2-(-1))^2 + (6-2)^2} \]
    \[ r = \sqrt{9 + 16} \]
    \[ r = \sqrt{25} \rightarrow r = 5 \]
    \[ (x+1)^2 + (y-2)^2 = 5^2 \]

14. \[ (x+1)^2 + (y-2)^2 = 25 \]
Graph the equation. Pay close attention to the scale of each graph.

16. \( x^2 + y^2 = 25 \)  
   ![Graph of \( x^2 + y^2 = 25 \)]

17. \( (x-1)^2 + y^2 = 4 \)  
   ![Graph of \( (x-1)^2 + y^2 = 4 \)]

18. \( x^2 + (y+2)^2 = 9 \)  
   ![Graph of \( x^2 + (y+2)^2 = 9 \)]

19. \( (x-3)^2 + (y+1)^2 = 4 \)  
   ![Graph of \( (x-3)^2 + (y+1)^2 = 4 \)]