Name _____ Class _____ Date _____

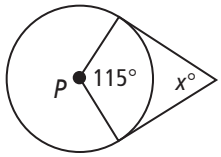
Extra Practice

Chapter 12

Lesson 12-1

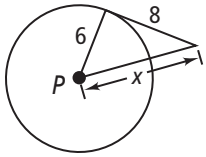
Assume that the lines that appear to be tangent are tangent. *P* is the center of each circle. Find the value of *x*.

1.



65

2.



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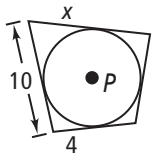
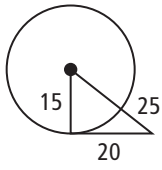
3.



6

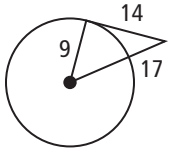
Determine whether a tangent line is shown in each diagram. Explain.

4.



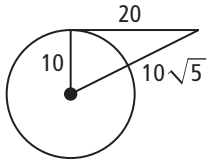
yes, $15^2 + 20^2 = 25^2$

5.



no, $9^2 + 14^2 \neq 17^2$

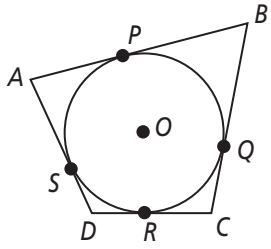
6.



yes, $10^2 + 20^2 = (10\sqrt{5})^2$

7. Given: Quadrilateral $ABCD$ is circumscribed about $\odot O$.

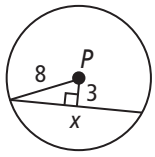
Prove: $AB + DC = BC + AD$ Tangents to a ○ from a point outside the ○ are ≅, so $AS = AP$, $BP = BQ$, $CQ = CR$, and $DR = DS$. By the Segment Add. Post. and various Props. of =, $AB + DC = AP + BP + DR + CR = AS + BQ + DS + CQ = BQ + CQ + AS + DS = BC + AD$



Lesson 12-2

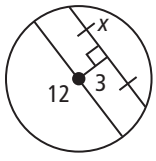
Find the value of *x* to the nearest tenth.

8.



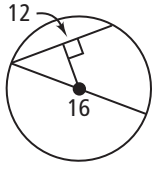
14.8

9.



5.2

10.



5.3

11. A polygon is inscribed in a circle. Are the perpendicular bisectors of the sides of the polygon concurrent? Explain. Yes. Each side of the polygon is a chord of the circle, and the ⊥ bis. of any chord contains the center of the circle.

12. A circle has a diameter of 4 units. A chord parallel to a diameter is 1.5 units from the center of the circle. The endpoints of the diameter and the chord are the vertices of an isosceles trapezoid. What is the distance from the center of the circle to each leg of the trapezoid? Round to the nearest hundredth. 1.82 units

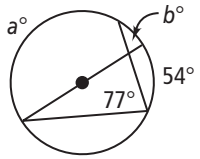
Extra Practice (continued)

Chapter 12

Lesson 12-3

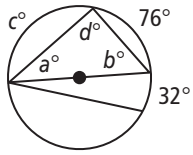
Find the value of each variable.

13.



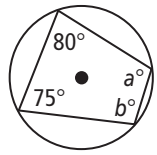
a = 154; *b* = 76

14.



a = 38; *b* = 52; *c* = 104; *d* = 90

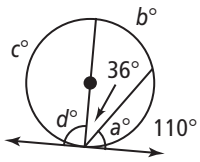
15.



a = 105; *b* = 100

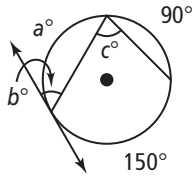
Find the value of each variable. Assume that rays that appear to be tangent are tangent.

16.



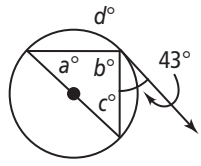
a = 55; *b* = 72; *c* = 178; *d* = 89

17.



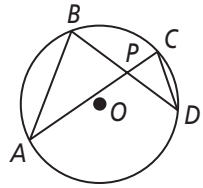
a = 120; *b* = 60; *c* = 75

18.



a = 43; *b* = 90; *c* = 47; *d* = 94

19. Given: $\angle A$ and $\angle D$ are inscribed angles in $\odot O$ that intercept $\overset{\frown}{BC}$, $\overline{BD}$, and $\overline{AC}$ intersect at P.

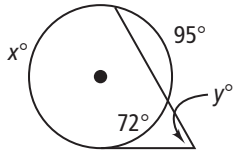


Prove: $\triangle APB \sim \triangle DPC$ *∠A ≅ ∠D since they both intercept* $\overset{\frown}{BC}$. *∠BPA ≅ ∠CPD because they are vertical ∡s. △APB ~ △DPC by AA~.*

Lesson 12-4

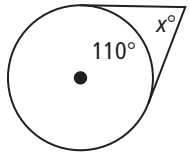
Assume that lines that appear to be tangent are tangent. Find the value of each variable.

20.



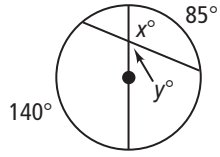
x = 193; *y* = 60.5

21.



70

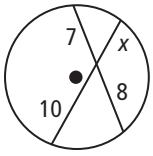
22.



x = 112.5; *y* = 67.5

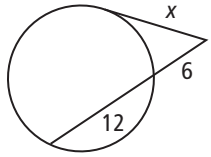
Find the value of each variable using the given chord, secant, and tangent lengths. If the answer is not a whole number, round to the nearest tenth.

23.



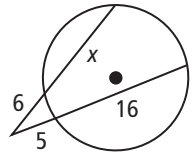
5.6

24.



about 10.4

25.

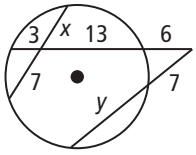


11.5

Extra Practice (continued)

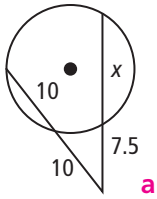
Chapter 12

26.



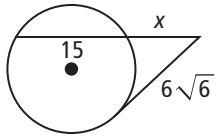
$x \approx 5.6$; $y \approx 11.9$

27.



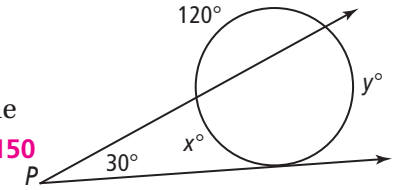
about 13.3

28.

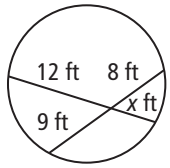


9

29. The outer rim of a circular garden will be planted with three colors of tulips. The landscaper has stretched two strings from a point P to help workers see how much of the circular rim should be planted with each color. Use the information in the figure at the right to find x and y. 90; 150



30. Planks are placed across the circular pool shown in the figure at the right. What is the length of the longer plank? 18 ft



Lesson 12-5

Write the standard equation of the circle with center P.

31. $P = (0, 0); r = 4$ $x^2 + y^2 = 16$

32. $P = (0, 5); r = 3$ $x^2 + (y - 5)^2 = 9$

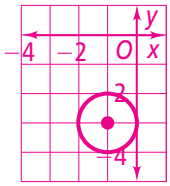
33. $P = (9, -3); r = 7$ $(x - 9)^2 + (y + 3)^2 = 49$

34. $P = (-4, 0)$; through $(2, 1)$ $(x + 4)^2 + y^2 = 37$

Find the center and radius of each circle. Then graph the circle.

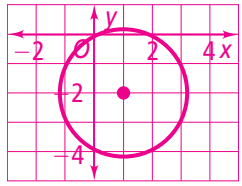
35. $(x + 1)^2 + (y + 3)^2 = 1$

$(-1, -3)$; $r = 1$;



36. $(x - 1)^2 + (y + 2)^2 = 5$

$(1, -2)$; $r = \sqrt{5}$



37. When a coordinate grid is imposed over a map, the location of a radio station is given by (113, 215). A town located at (149, 138) is at the outermost edge of the circular region where clear reception is assured.

a. Write an equation that describes the boundary of the clear reception region. $(x - 113)^2 + (y - 215)^2 = 85^2$

b. If the radio station boosts power to increase the size of the clear-reception region by a factor of 4, what will be the equation for the new boundary for clear reception? $(x - 113)^2 + (y - 215)^2 = 170^2$

Name _____ Class _____ Date _____

Extra Practice (continued)

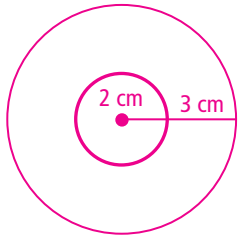
Chapter 12

Lesson 12-6

Draw and describe each locus.

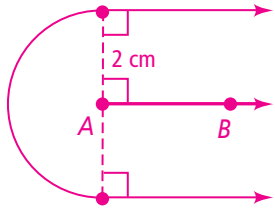
38. all points in a plane 3 cm from a circle with $r = 2$ cm

a circle of radius 5 cm, concentric with the orig. circle



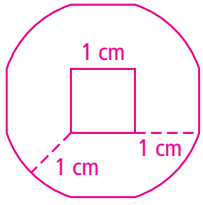
39. all points in a plane 2 cm from $\overrightarrow{AB}$

two rays $\parallel$ to and 2 cm from $\overrightarrow{AB}$, and the semicircle of radius 2 cm with center *A*, opp. pt. *B*



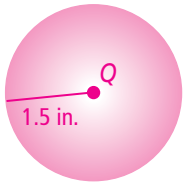
40. all points in a plane 1 cm from a square with a 4 cm perimeter

a figure with four corners consisting of quarter circles with radius 1 cm separated by straight sides of 1 cm each;



41. all points in space 1.5 in. from a point Q

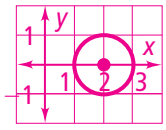
a sphere of radius 1.5 in., and center *Q*



Draw each locus on the coordinate plane.

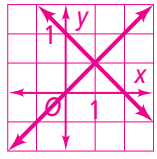
42. all points 1 unit from (2, 0)

a circle with radius 1 unit centered at (2, 0);



43. all points equidistant from $x = 1$ and $y = 1$

lines with equations $y = x$ and $y = -x + 2$;



44. A dog is on a 20-ft leash. The leash is attached to a pipe at the midpoint of the back wall of a 30 ft-by-30 ft house, as shown in the diagram. Sketch and use shading to indicate the region in which the dog can play while attached to the leash. Include measurements to describe the region.