Geometry H   Name: _____
Unit 7 Review – Circles   Date: _____ Period: _____

The Unit 7 Assessment will be on Thursday/Friday May 18/19. The following is a list of topics that you may use to study for your Unit 7 Assessment. The topics are listed in the same order that you learned each concept.

Circle Basics and Properties of Tangents (10.1)
- ✓ Identify special segments and lines of circles
- ✓ Identify and draw common tangents to circles
- ✓ Verify a tangent to a circle using theorem 10.1 (page 653)
- ✓ Find radius length of circle using theorem 10.1 (page 653)
- ✓ Find lengths of tangent segments drawn from a common external point (theorem 10.2 on page 654)

Measures of Arcs and Angles of Circles (10.2, 10.4, 10.5)
- ✓ Identify and name minor arcs, major arcs, and semicircles
- ✓ Find measures of central angles, minor arcs, major arcs, and semicircles
- ✓ Determine if arcs are congruent
- ✓ Find measures of inscribed angles (theorem 10.7 on page 672)
- ✓ Find measures of angles of quadrilaterals inscribed in a circle (theorem 10.10 on page 675)
- ✓ Find measures of angles and arcs formed by a tangent intersecting a chord at a point on the circle (theorem 10.11 on page 680)
- ✓ Find measures of angles and arcs formed by chords that intersect inside the circle (theorem 10.12 on page 681)
- ✓ Find measures of angles and arcs formed by intersecting tangents and secants outside the circle (theorem 10.13 on page 681)

Find Segment Lengths in Circles (10.6)
- ✓ Find lengths of segments formed by intersecting chords in a circle (theorem 10.14 on page 689)
- ✓ Find lengths of segments formed by intersecting secants or intersecting secants and tangents outside a circle (theorems 10.15 and 10.16 on pages 690-691)
- ✓ Solve real world applications involving intersecting secants or intersecting secants and tangents similar to Example 4 on page 692

Write and Graph Equations of Circles (10.7)
- ✓ Write equation of circle in standard form
- ✓ Identify center and radius of circle given equation in standard form
- ✓ Identify center and radius of a circle given equation in general form (complete the square!)
- ✓ Graph a circle in the coordinate plane
- ✓ Prove or disprove that a point lies on a circle
- ✓ Use graphs of circles to solve real world problems

Matching Match the notation with the term that best describes it.

1. D A. Center
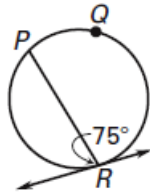
2. $\overleftrightarrow{FH}$ B. Chord

3. $\overline{CD}$ C. Diameter

4. $\overline{AB}$ D. Radius

5. C E. Point of tangency

6. $\overline{AD}$ F. Common external tangent

7. $\overleftrightarrow{AB}$ G. Common internal tangent

8. $\overleftrightarrow{DE}$ H. Secant
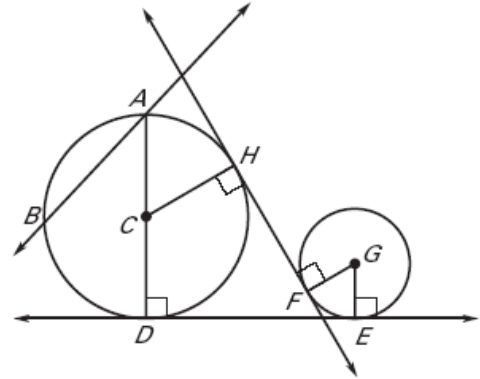
Multiple Choice Choose the letter of the best answer.

9. Find $m\overparen{PQR}$.
    A) 285°

    B) 105°

    C) 210°

    D) 185°

10. Find RS.
    A) 10

    B) 8

    C) 12

    D) 13
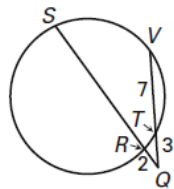
11. How many arc degrees are in the minor arc?
    A) 32.5°

    B) 65°

    C) 115°

    D) Not enough information
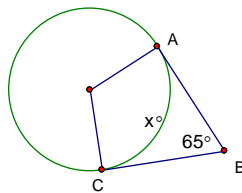
12. What is $m\angle TQR$?

A) 65°

B) 70°
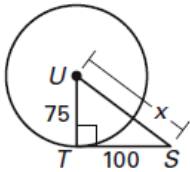
C) 110°

D) 115°

T

(3x + 5)°

Q

(5x + 15)° R

(4x + 30)° S
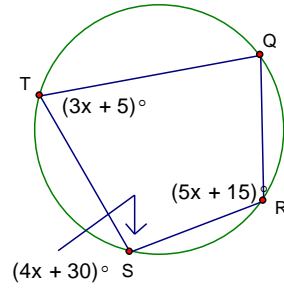
13. Two diameters of $\odot P$ are $\overline{AB}$ and $\overline{CD}$. Given that $m\widehat{BC} = 70°$, what is $m\angle ABC$? (hint: draw a picture!)
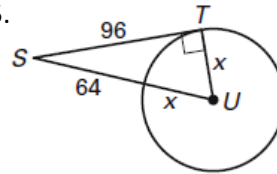
A) 35°

B) 55°

C) 70°

D) 110°

Open Ended

$\overline{TU}$ is a radius of $\odot U$ and $\overline{ST}$ is tangent to $\odot U$. Find the value of *x*.

14.

U

75

T   100   S

x

15.

96

S

64

T

x

x   U

$\overline{PS}$ and $\overline{QT}$ are diameters of $\odot U$. Find the indicated measure.

16. $m\angle QUR = $ _____

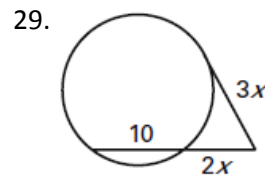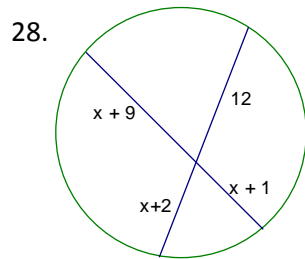17. $m\widehat{PQR} = $ _____

18. $m\widehat{STQ} = $ _____

19. $m\widehat{RST} = $ _____
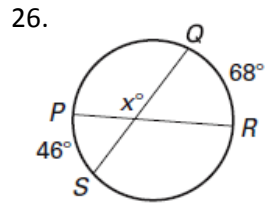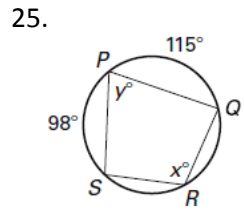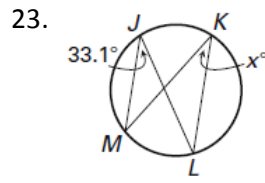
20. $m\widehat{TP} = $ _____

21. $m\widehat{RQT} = $ _____

R

43.6°

Q

P

S

U

T

15.5°
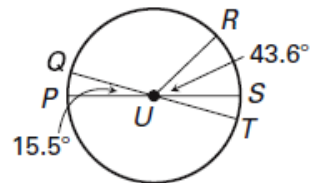
Find the value(s) of the variables.

22.

(5x + 60)°

(3x + 25)°

23.

33.1°   x°

24.   (13x − 6)°

(5x + 14)°

54°

25.

115°

98°

y°

x°

26.

68°

x°

46°

27.

D

E

(5x + 2)°

242°

F

28.

12

x + 9

x + 1

x+2

29.

3x

10

2x
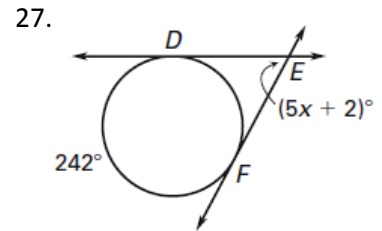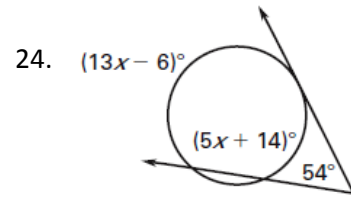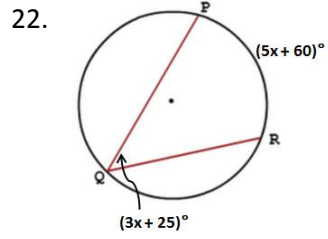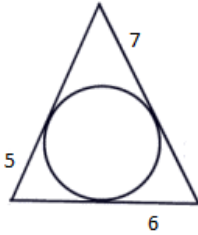
30. In the diagram below, $BE = 7$, $BO = 14$, $AD = 6$, and $CD = 12$. Find the values of x and y.
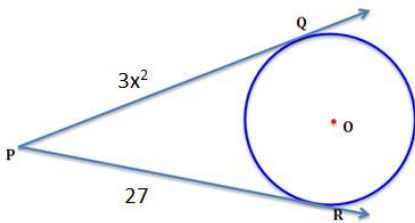

O

C

y

B

x

A   E

D
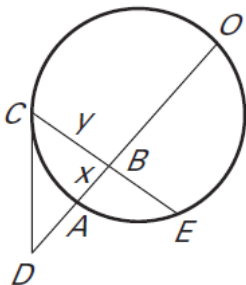
31. Suppose a space shuttle is orbiting at an altitude 180 miles above Earth ($\overline{AD}$). Use the diagram to find *AB,* the distance from the shuttle to the horizon? The radius of Earth is about 4000 miles. Round your answer to the nearest tenth.
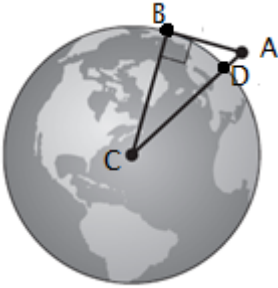
32. Find the perimeter of the circumscribed triangle.

33. Given that *Q* and *R* are both points of tangency, please solve for x.

34. A hummingbird is flying toward a large tree. When it is 27 feet from the **center of the tree**, its lines of sight form two tangents.

a)   If the radius of the tree is 7 feet, then please find *AC* and *BC* to the nearest foot.

b)   What is the portion ($m\widehat{AB}$) of the tree's surface that the hummingbird can see? Round to the nearest tenth.
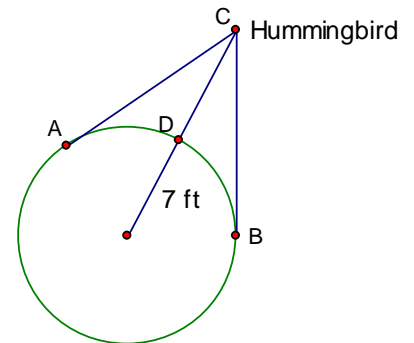
35. Find the center and radius of the circle defined by $x^2 + y^2 + 4x + 8y = 5$. Then graph the circle.
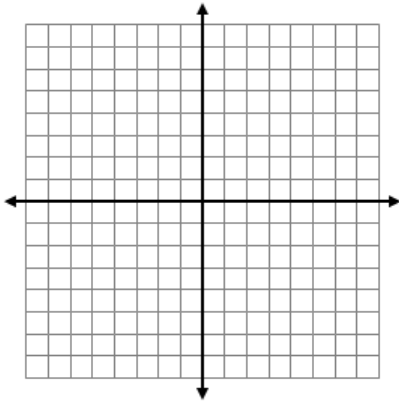
36. Prove or disprove whether or not the point $(1, 8)$ lies on the circle $(x + 2)^2 + (y + 4)^2 = 25$.

37. Jamie is designing a park and wants to include a carousel. On a blueprint, suppose that the center of the carousel is at the origin and that one of the railings on the circumference of the carousel has coordinates $(3, 4)$.
   a. Write an equation to represent the circular path the carousel follows as it spins.

   b. If one unit on the coordinate plane is equivalent to 1 foot, find the diameter of the carousel.

Answer Key

1. E
2. G
3. D
4. B
5. A
6. C
7. H
8. F
9. C
10. D
11. C
12. B
13. B
14. 125
15. 40
16. 120.9°
17. 136.4°
18. 195.5°
19. 59.1°
20. 164.5°
21. 300.9°
22. 10
23. 33.1
24. 16
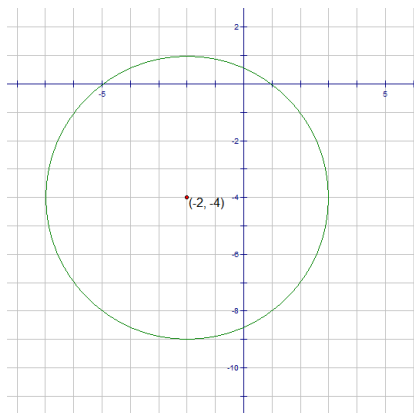25. x = 106.5, y = 73.5
26. 123
27. 12
28. 5
29. 4
30. x = 4, y = 8

31. 1213.4 miles
32. 36
33. $x = \pm 3$
34. a) $AC = BC \approx 26 \, ft$ b) $m\widehat{AB} \approx 150°$
35. center: (-2, -4), radius: 5;

36. $153 \neq 25$, the point does not lie on the circle
37. a) $x^2 + y^2 = 25$ b) 10 feet