Name: ________________________ Class: ___________________ Date: __________ ID: A

Q3 Geometry Review

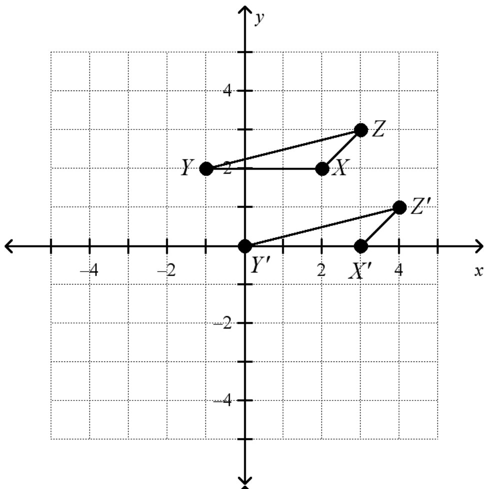
Multiple Choice

Identify the choice that best completes the statement or answers the question.

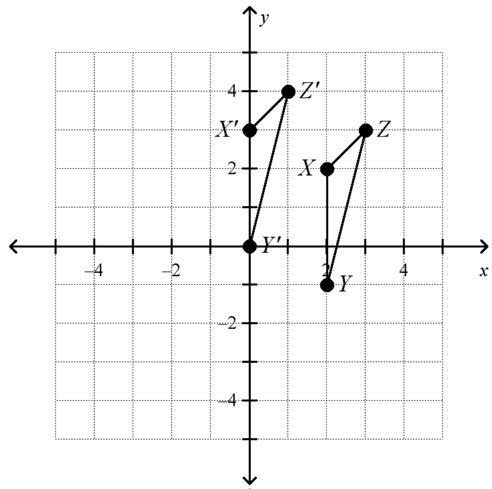
Graph the image of each figure under a translation by the given vector.

____ 1. ΔXYZ with vertices $X(2, 2)$, $Y(-1, 2)$, $Z(3, 3)$; $\vec{a} = < 1, -2 >$

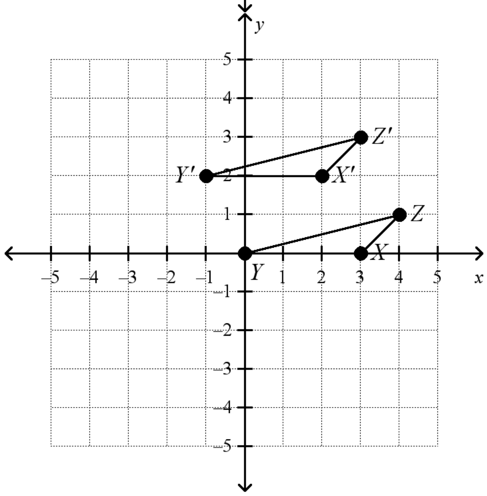
a.



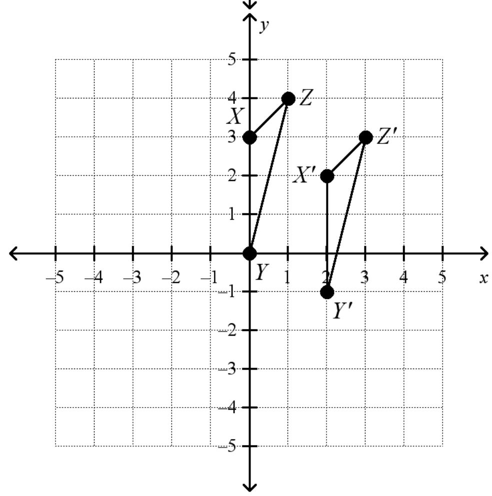
c.



b.



d.

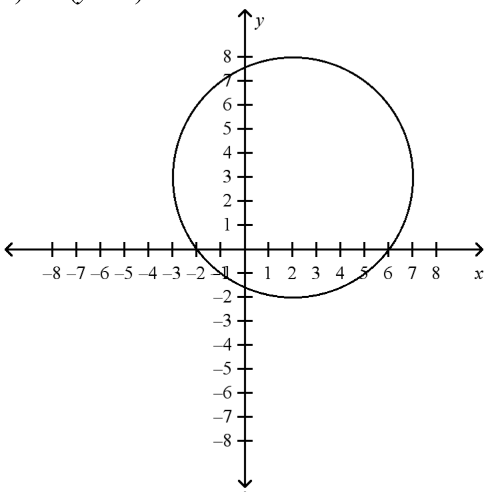


Name: ______________________ **ID: A**

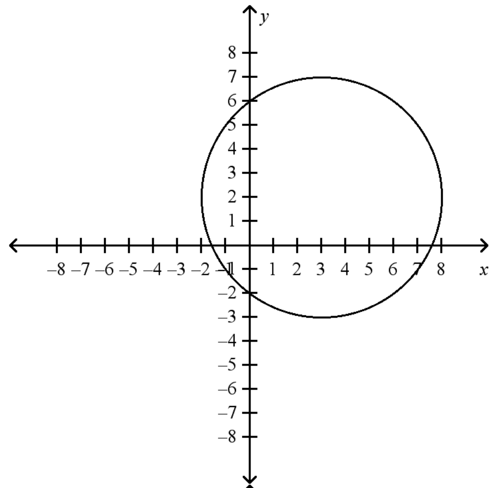
Graph the equation.

____ 2. $(x+2)^2 + (y+3)^2 = 25$

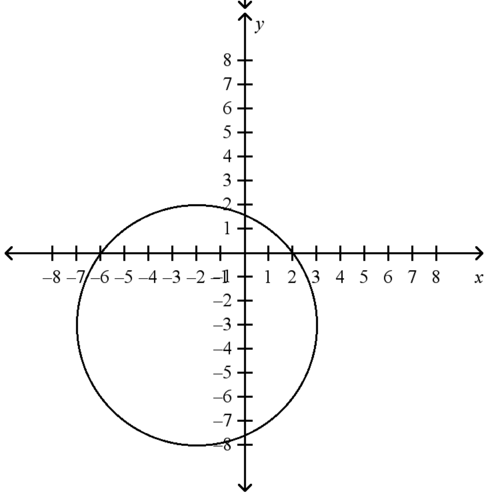
a.



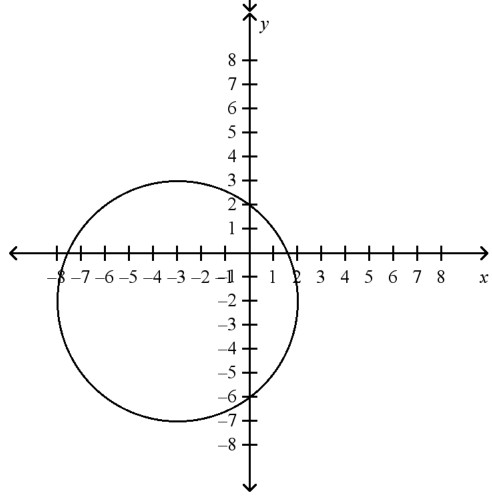
c.



b.



d.

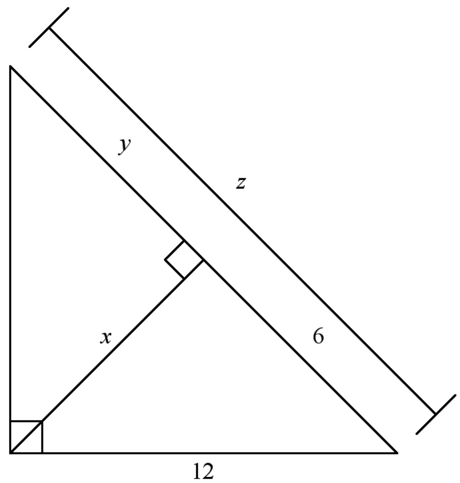


Short Answer

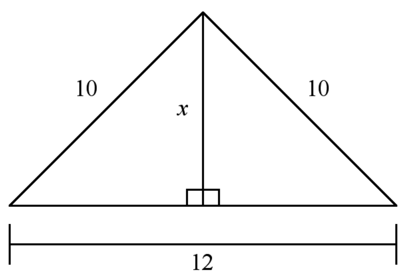
3. Find the geometric mean between each pair of numbers.
$\sqrt{100}$ and $\sqrt{484}$

Name: ______________________ **ID: A**

4. Find x, y, and z.



5. Find x.

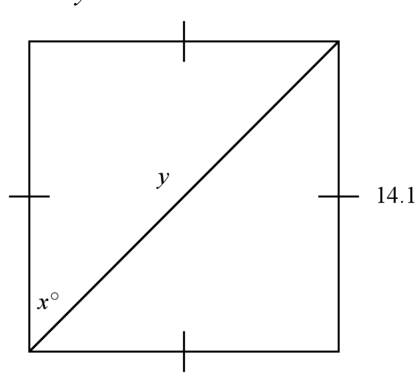


Determine whether ΔQRS is a right triangle for the given vertices. Explain.

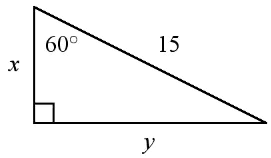
6. $Q(12, -2)$, $R(9, 16)$, $S(-12, -6)$

7. The length of a diagonal of a square is $10\sqrt{2}$ millimeters. Find the perimeter of the square.

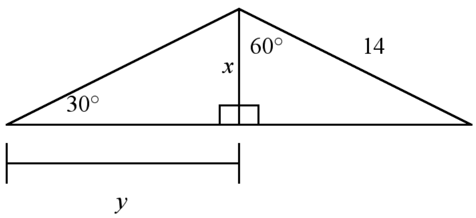
8. Find x and y.



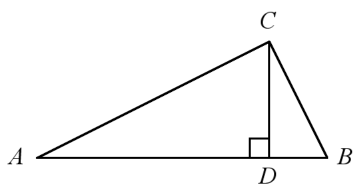
9. Find x and y.



10. Find x and y.



11. Use the figure to find the trigonometric ratio below. Express the answer as a decimal rounded to the nearest ten-thousandth.
tan B



$AC = \sqrt{193}$, $CB = 5\sqrt{2}$, $AD = 12$, $CD = 7$, $DB = 1$

12. Dante is standing at horizontal ground level with the base of the Empire State Building in New York City. The angle formed by the ground and the line segment from his position to the top of the building is 48.4°. The height of the Empire State Building is 1472 feet. Find his distance from the Empire State Building to the nearest foot.

13. Lynn is standing at horizontal ground level with the base of the Sears Tower in Chicago. The angle formed by the ground and the line segment from her position to the top of the building is 15.7°. The height of the Sears Tower is 1450 feet. Find her distance from the Sears Tower to the nearest foot.

14. A hot air balloon is one mile above sea level when it begins to climb at a constant angle of 4° for the next 50 ground miles. About how far above sea level is the hot air balloon after its climb?

15. A hiker stops to rest and sees a deer in the distance. If the hiker is 48 yards lower than the deer and the angle of elevation from the hiker to the deer is 15°, find the distance from the hiker to the deer.

16. Two horses are observed by a hang glider 80 meters above a meadow. The angles of depression are 10.4° and 8°. How far apart are the horses?

17. After traveling steadily at 400 meters above a shipwrecked hull, a submerged vessel starts to descend when its ground distance from the hull is 7 kilometers. What is the angle of depression for this part of the travel?

18. A playground is situated on a triangular plot of land. Two sides of the plot are 175 feet long and they meet at an angle of 70°. For safety reasons, a fence is to be placed along the perimeter of the property. How much fencing material is needed?

19. Two lifeguards at the lake are stationed 28 meters apart. They both located a struggling swimmer at the same time. The first lifeguard indicated that the position of the swimmer made an angle of 50° with the line between the lifeguard chairs. The second lifeguard indicated that the swimmer made an angle of 56° with the same line. How far is the first lifeguard from the swimmer?

20. In ΔABC, given the following measures, find the measure of the missing side to the nearest tenth..
$a = 16.3$, $c = 10.4$, $m\angle B = 39.2$

21. In ΔDEF, given the lengths of the sides, find the measure of the stated angle to the nearest degree.
$d = 8.9$, $e = 21.4$, $f = 22.8$; $m\angle F$

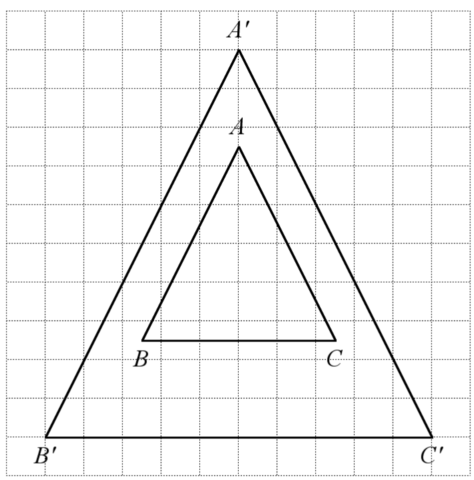
Members of the soccer team are trying to map out some new plays before their next game. The goal is 24 feet wide.

22. Pedro came up with a play that would put him 35 feet from one goal post and 45 feet from the other post. What is his angle to make a shot on goal?

Graph each figure and its image under the given translation.

23. ΔEFG with vertices $E(-2, -3)$, $F(-3, -2)$, $G(-1, -1)$ under the translation left three units and down two units

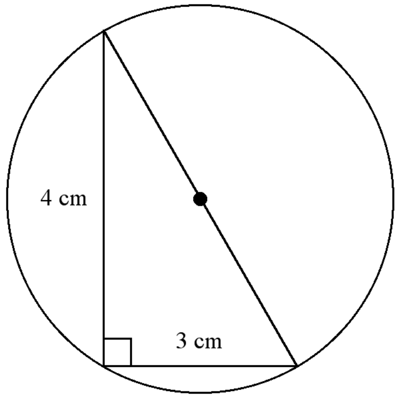
Determine the scale factor for each dilation. Determine whether the dilation is an enlargement, reduction, or congruence transformation.

24. 

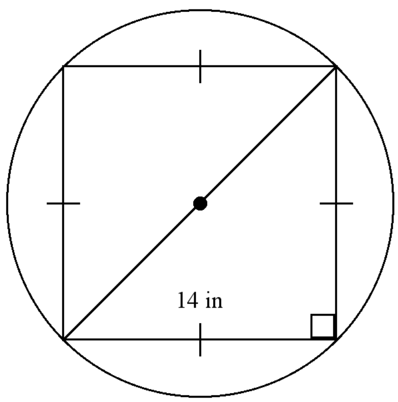
25. Find the magnitude and direction of $\overrightarrow{CD}$ for the given coordinates. Round to the nearest tenth.
$C(-8, -8)$, $D(-4, -5)$

26. What is the magnitude and direction of $\vec{w} < -18, -2 >$? Round to the nearest tenth.

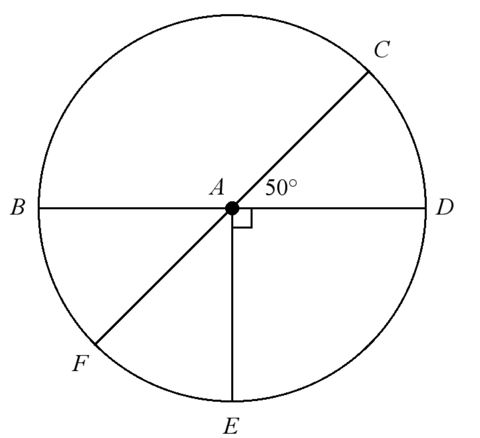
27. Find the exact circumference of the circle.



28. Find the exact circumference of the circle.



Use the diagram to find the measure of the given angle.



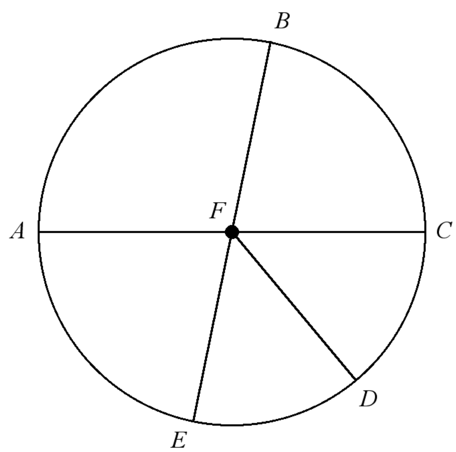
29. $m\angle BAC$
30. $m\angle BAF$
31. $m\angle EAD$

32. $m\angle FAE$

33. $m\angle CAE$

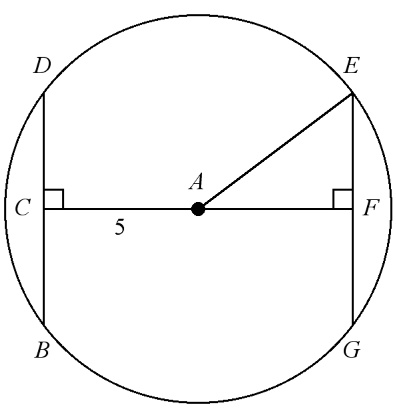
34. $m\angle DAF$

35. In $\odot F$, $\angle CFD \cong \angle DFE$, $m\angle BFA = 3x$, $m\angle AFE = 2x + 20$, and $\overline{BE}$ and $\overline{AC}$ are diameters.



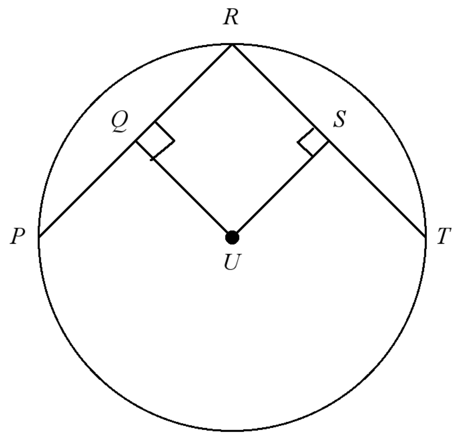
Find m arc DC.

36. In $\odot A$, $\overline{AC} \cong \overline{AF}$ and AE = 13.

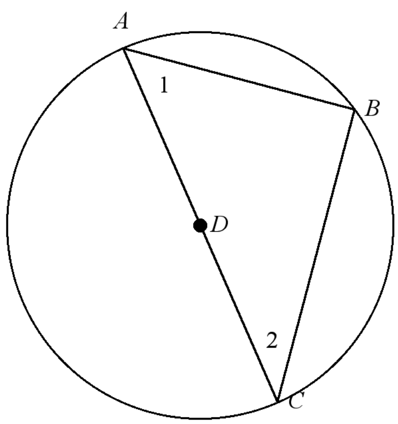


Find $m\overline{EG}$.

37. In $\odot U$, $TS = 10$, $UQ = US$. Find $m\overline{PR}$.

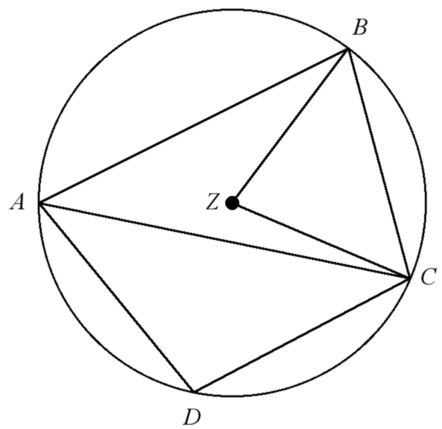


38.

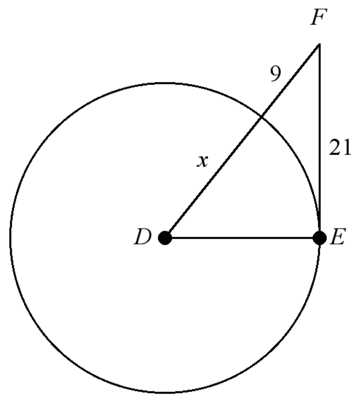


If $m\angle 1 = 5x + 6$, $m\angle 2 = 7x$, find $m\angle 1$.

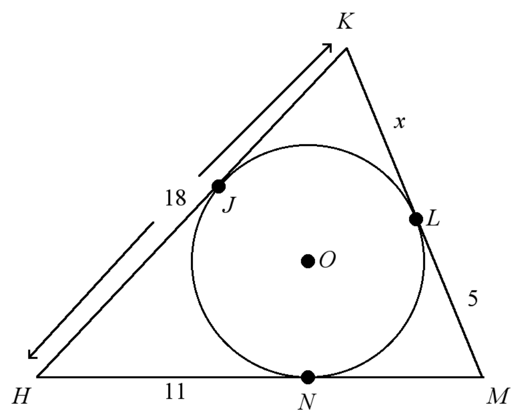
39. Quadrilateral $ABCD$ is inscribed in $\odot Z$ such that $\overline{AB} \parallel \overline{DC}$ and $m\angle BZC = 76$. Find $m\angle DCA$.



40. Find x. Assume that segments that appear tangent are tangent.

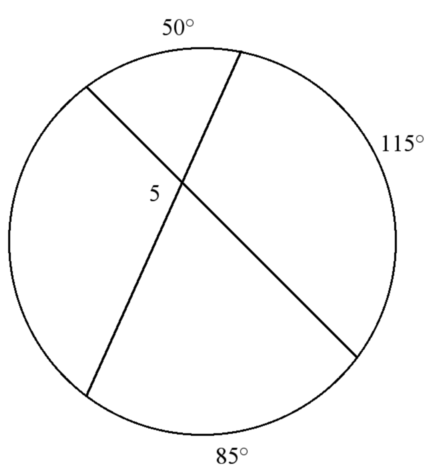


41. Find x. Assume that segments that appear tangent are tangent.

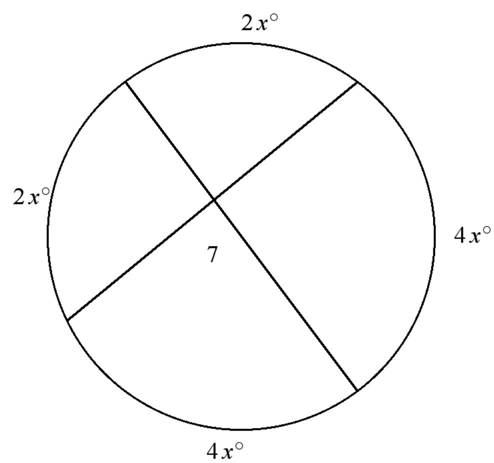


Find the measure of the numbered angle.

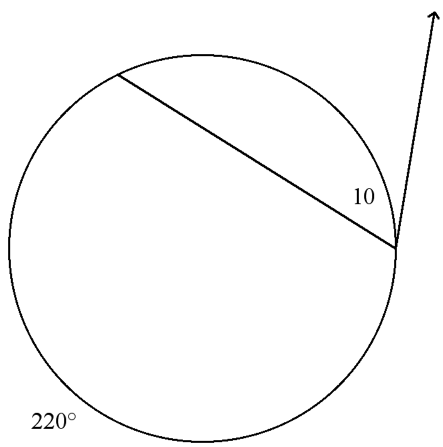
42.



43.

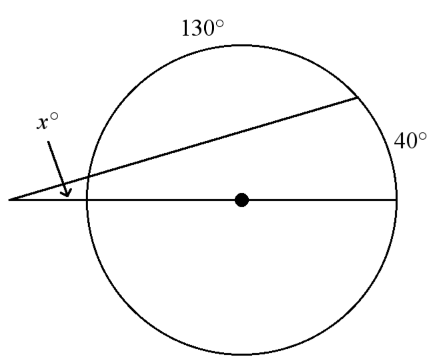


44.

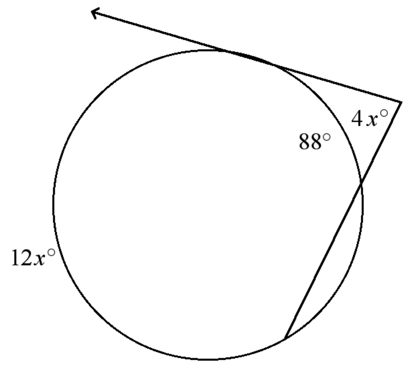


Find x. Assume that any segment that appears to be tangent is tangent.

45.

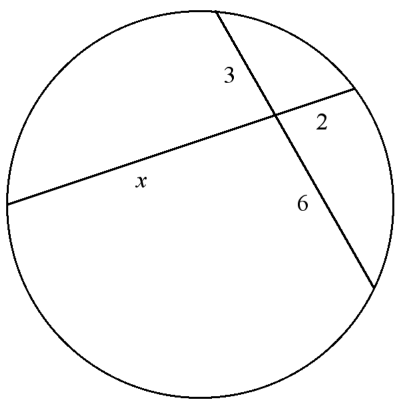


46.



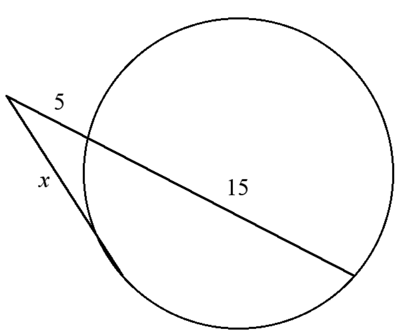
Find x. Round to the nearest tenth if necessary.

47.



Find x. Round to the nearest tenth if necessary. Assume that segments that appear to be tangent are tangent.

48.



49. Write an equation for a circle with center at $(3, -7)$ and diameter 24.

50. Write an equation for a circle with a diameter that has endpoints at (–7, 7) and (–3, 1). Round to the nearest tenth if necessary.

Q3 Geometry Review
Answer Section

MULTIPLE CHOICE

1. ANS: A

First graph the figure. Then, translate each vertex by the vector. Connect the vertices of the shape formed by the translation.

	Feedback
A	Correct!
B	Which figure is the translation?
C	Check your x and y values.
D	Did you graph the preimage correctly?

PTS: 1 DIF: Average REF: Lesson 9-6
OBJ: 9-6.2 Perform translations with vectors. STA: {Key}22.0
TOP: Perform translations with vectors. KEY: Vectors | Translations
MSC: Key

2. ANS: B

The graph of an equation of the form $(x-h)^2+(y-k)^2=r^2$ will be a circle centered at (h,k) and with radius r.

	Feedback
A	Reverse your center coordinates.
B	Correct!
C	Check the signs of your center coordinates and reverse the x and y coordinates.
D	Check the signs of your center coordinates.

PTS: 1 DIF: Average REF: Lesson 10-8
OBJ: 10-8.2 Graph a circle on the coordinate plane. STA: {Key}17.0
TOP: Graph a circle on the coordinate plane.
KEY: Circles | Graph Circles | Coordinate Plane MSC: Key

SHORT ANSWER

3. ANS:

$2\sqrt{55}$

Find the product of the given numbers. Find the square root of the product.

PTS: 1 DIF: Basic REF: Lesson 8-1
OBJ: 8-1.1 Find the geometric mean between two numbers. STA: {Key}4.0
TOP: Find the geometric mean between two numbers. KEY: Geometric Mean
MSC: Key

4. ANS:
$x \cup 10.4$, $y = 18$, $z = 24$
The altitude is the geometric mean between the measures of the two segments of the hypotenuse.

PTS: 1 DIF: Average REF: Lesson 8-1
OBJ: 8-1.2 Solve problems involving relationships between parts of a right triangle and the altitude hypotenuse. STA: {Key}4.0
TOP: Solve problems involving relationships between parts of a right triangle and the altitude hypotenuse. KEY: Triangles | Altitudes | Hypotenuse MSC: Key

5. ANS:
8
Divide the large triangle into two right triangles. Which side is the hypotenuse? Which sides are the legs? Substitute the values into the Pythagorean Theorem to solve for the missing variable.

PTS: 1 DIF: Basic REF: Lesson 8-2
OBJ: 8-2.1 Use the Pythagorean Theorem.
STA: {Key}12.0 | {Key}14.0 | 15.0 TOP: Use the Pythagorean Theorem.
KEY: Pythagorean Theorem MSC: Key

6. ANS:
yes; $QR = 3\sqrt{37}$, $QS = 4\sqrt{37}$, $RS = 5\sqrt{37}$; $QR^2 + QS^2 = RS^2$
Use the distance formula to determine the lengths of the sides. If the sum of the squares of the two shorter sides is equal to the square of the third side, the triangle is a right triangle.

PTS: 1 DIF: Average REF: Lesson 8-2
OBJ: 8-2.2 Use the converse of the Pythagorean Theorem.
STA: {Key}12.0 | {Key}14.0 | 15.0 TOP: Use the converse of the Pythagorean Theorem.
KEY: Converse of Pythagorean Theorem MSC: Key

7. ANS:
40 millimeters
To find the leg of a 45°-45°-90° triangle when the hypotenuse is given, divide the hypotenuse by $\sqrt{2}$. To find the perimeter of the square, find the sum of all the sides.

PTS: 1 DIF: Average REF: Lesson 8-3
OBJ: 8-3.1 Use properties of 45°-45°-90° triangles. STA: 20.0
TOP: Use properties of 45°-45°-90° triangles.
KEY: Triangles | 45-45-90 Triangles

8. ANS:
$x = 45°$, $y = 14.1\sqrt{2}$
The length of the hypotenuse is equal to the length of a leg times $\sqrt{2}$. The diagonal of a square bisects the angle.

PTS: 1 DIF: Basic REF: Lesson 8-3
OBJ: 8-3.1 Use properties of 45°-45°-90° triangles. STA: 20.0
TOP: Use properties of 45°-45°-90° triangles.
KEY: Triangles | 45-45-90 Triangles

9. ANS:
$x = 7.5$, $y = 7.5\sqrt{3}$
The shorter leg is half the length of the hypotenuse. The longer leg is $\sqrt{3}$ times the length of the shorter leg.

PTS: 1 DIF: Basic REF: Lesson 8-3
OBJ: 8-3.2 Use properties of 30º-60º-90º triangles. STA: 20.0
TOP: Use properties of 30º-60º-90º triangles.
KEY: Triangles | 30-60-90 Triangles

10. ANS:
$x = 7$, $y = 7\sqrt{3}$
The shorter leg is half the length of the hypotenuse. The longer leg is $\sqrt{3}$ times the length of the shorter leg.

PTS: 1 DIF: Average REF: Lesson 8-3
OBJ: 8-3.2 Use properties of 30º-60º-90º triangles. STA: 20.0
TOP: Use properties of 30º-60º-90º triangles.
KEY: Triangles | 30-60-90 Triangles

11. ANS:
7.0000
Determine the ratio associated with the given trigonometric term. Divide the numerator by the denominator.

PTS: 1 DIF: Average REF: Lesson 8-4
OBJ: 8-4.1 Find trigonometric ratios using right triangles. STA: {Key}18.0 | {Key}19.0
TOP: Find trigonometric ratios using right triangles.
KEY: Trigonometric Ratios | Right Triangles MSC: Key

12. ANS:
1307 ft
Draw a picture of the situation. Determine which trigonometric ratio should be used to solve. Substitute the numbers given. Solve for the answer.

PTS: 1 DIF: Basic REF: Lesson 8-4
OBJ: 8-4.2 Solve problems using trigonometric ratios. STA: {Key}18.0 | {Key}19.0
TOP: Solve problems using trigonometric ratios.
KEY: Trigonometric Ratios | Solve Problems MSC: Key

13. ANS:
5159 ft
Draw a picture of the situation. Determine which trigonometric ratio should be used to solve. Substitute the numbers given. Solve for the answer.

PTS: 1 DIF: Average REF: Lesson 8-4
OBJ: 8-4.2 Solve problems using trigonometric ratios. STA: {Key}18.0 | {Key}19.0
TOP: Solve problems using trigonometric ratios.
KEY: Trigonometric Ratios | Solve Problems MSC: Key

14. ANS:
4.5 mi
Draw a picture of the situation. Determine which trigonometric ratio should be used to solve. Substitute the numbers given. Solve for the answer.

PTS: 1 DIF: Basic REF: Lesson 8-4
OBJ: 8-4.2 Solve problems using trigonometric ratios. STA: {Key}18.0 | {Key}19.0
TOP: Solve problems using trigonometric ratios.
KEY: Trigonometric Ratios | Solve Problems MSC: Key

15. ANS:
185.46 yd
Draw a picture of the situation. Determine which trigonometric ratio should be used to solve. Substitute the numbers given. Solve for the answer.

PTS: 1 DIF: Average REF: Lesson 8-5
OBJ: 8-5.1 Solve problems involving angles of elevation. STA: {Key}19.0
TOP: Solve problems involving angles of elevation. KEY: Angle of Elevation
MSC: Key

16. ANS:
133.3 m
Draw a picture of the situation. Determine which trigonometric ratio should be used to solve. Substitute the numbers given. Solve for the answer.

PTS: 1 DIF: Average REF: Lesson 8-5
OBJ: 8-5.2 Solve problems involving angles of depression. STA: {Key}19.0
TOP: Solve problems involving angles of depression. KEY: Angle of Depression
MSC: Key

17. ANS:
3.27°
Draw a picture of the situation. Determine which trigonometric ratio should be used to solve. Substitute the numbers given. Solve for the answer.

PTS: 1 DIF: Average REF: Lesson 8-5
OBJ: 8-5.2 Solve problems involving angles of depression. STA: {Key}19.0
TOP: Solve problems involving angles of depression. KEY: Angle of Depression
MSC: Key

18. ANS:
550.8 ft
Draw a picture of the situation. Use the Law of Sines to solve. Substitute the numbers given. Solve for the missing side. Find the perimeter.

PTS: 1 DIF: Average REF: Lesson 8-6
OBJ: 8-6.2 Solve problems by using the Law of Sines.
TOP: Solve problems by using the Law of Sines.
KEY: Law of Sines | Solve Problems

19. ANS:
    24.1 m
    Draw a picture of the situation. Use the Law of Sines to solve. Substitute the numbers given. Solve for the requested side.

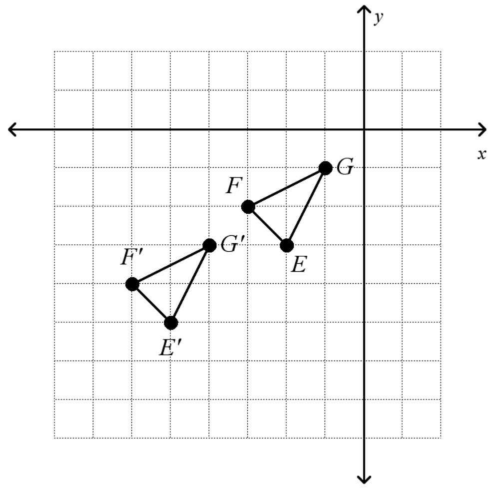
    PTS: 1 DIF: Average REF: Lesson 8-6
    OBJ: 8-6.2 Solve problems by using the Law of Sines.
    TOP: Solve problems by using the Law of Sines.
    KEY: Law of Sines | Solve Problems
20. ANS:
    $b = 10.5$
    Substitute the given values into the Law of Cosines. Simplify the equation. Find the square root of both sides.

    PTS: 1 DIF: Average REF: Lesson 8-7
    OBJ: 8-7.1 Use the Law of Cosines to solve triangles.
    TOP: Use the Law of Cosines to solve triangles.
    KEY: Law of Cosines | Solve Triangles
21. ANS:
    87
    Substitute the given values into the Law of Cosines. Simplify the equation. Find the measure of the stated angle by using inverse cosine.

    PTS: 1 DIF: Average REF: Lesson 8-7
    OBJ: 8-7.1 Use the Law of Cosines to solve triangles.
    TOP: Use the Law of Cosines to solve triangles.
    KEY: Law of Cosines | Solve Triangles
22. ANS:
    31.9
    Substitute the given values into the Law of Cosines. Simplify the equation. Find the measure of the stated angle by using inverse cosine.

    PTS: 1 DIF: Average REF: Lesson 8-7
    OBJ: 8-7.2 Solve problems by using the Law of Cosines.
    TOP: Solve problems by using the Law of Cosines.
    KEY: Law of Cosines | Solve Problems

23. ANS:



Graph the original image. Determine how many units to add or subtract to each coordinate. Graph the new image.

PTS: 1 DIF: Basic REF: Lesson 9-2
OBJ: 9-2.1 Draw translated images using coordinates. STA: {Key}22.0
TOP: Draw translated images using coordinates.
KEY: Translations | Coordinate Plane MSC: Key

24. ANS:
2; enlargement
If $|r| > 1$, the dilation is an enlargement. If $0 < |r| < 1$, the dilation is a reduction. If $|r| = 1$, the dilation is a congruence transformation.

PTS: 1 DIF: Average REF: Lesson 9-5
OBJ: 9-5.1 Determine whether a dilation is an enlargement, a reduction, or a congruence transformation. STA: 11.0
TOP: Determine whether a dilation is an enlargement, reduction, or congruence transformation.
KEY: Dilations

25. ANS:
5.0, 36.9°
To find the magnitude, find the distance between the given points. To find the direction, use the tangent ratio.

PTS: 1 DIF: Average REF: Lesson 9-6
OBJ: 9-6.1 Find magnitude and direction of vectors. STA: {Key}22.0
TOP: Find magnitudes and directions of vectors. KEY: Vectors
MSC: Key

26. ANS:
18.1, 186.3°
To find the magnitude, find the distance between the given points. To find the direction, use the tangent ratio.

PTS: 1 DIF: Average REF: Lesson 9-6
OBJ: 9-6.1 Find magnitude and direction of vectors. STA: {Key}22.0
TOP: Find magnitudes and directions of vectors. KEY: Vectors
MSC: Key

27. ANS:
5π cm
The circumference formula is diameter × π. The diameter shown also happens to be the hypotenuse of the right triangle inscribed in the circle, so it can be found by using the Pythagorean Theorem.

PTS: 1 DIF: Average REF: Lesson 10-1
OBJ: 10-1.2 Solve problems involving the circumference of a circle.
STA: {Key}8.0 TOP: Solve problems involving the circumference of a circle.
KEY: Circles | Circumference MSC: Key

28. ANS:
$14\pi\sqrt{2}$ in
The circumference formula is diameter × π. The diameter shown also happens to be the diagonal of a square, so it can be found by multiplying the side of the square by $\sqrt{2}$.

PTS: 1 DIF: Average REF: Lesson 10-1
OBJ: 10-1.2 Solve problems involving the circumference of a circle.
STA: {Key}8.0 TOP: Solve problems involving the circumference of a circle.
KEY: Circles | Circumference MSC: Key

29. ANS:
130
$\angle BAC$ forms a linear pair with $\angle CAD$, so their sum is 180.

PTS: 1 DIF: Basic REF: Lesson 10-2
OBJ: 10-2.1 Recognize major arcs, minor arcs, semicircles, and central angles, and their measures.
STA: {Key}7.0
TOP: Recognize major arcs, minor arcs, semicircles, and central angles, and their measures.
KEY: Major Arcs | Minor Arcs | Semicircles | Central Angles MSC: Key

30. ANS:
50
$\angle BAF$ is a vertical angle with $\angle BAC$, so they are congruent.

PTS: 1 DIF: Basic REF: Lesson 10-2
OBJ: 10-2.1 Recognize major arcs, minor arcs, semicircles, and central angles, and their measures.
STA: {Key}7.0
TOP: Recognize major arcs, minor arcs, semicircles, and central angles, and their measures.
KEY: Major Arcs | Minor Arcs | Semicircles | Central Angles MSC: Key

31. ANS:
90
$\angle EAD$ is a right angle, so its measure is 90.

PTS: 1 DIF: Basic REF: Lesson 10-2
OBJ: 10-2.1 Recognize major arcs, minor arcs, semicircles, and central angles, and their measures.
STA: {Key}7.0
TOP: Recognize major arcs, minor arcs, semicircles, and central angles, and their measures.
KEY: Major Arcs | Minor Arcs | Semicircles | Central Angles MSC: Key

32. ANS:
40
$\angle FAE$ is complementary with $\angle BAF$.

PTS: 1 DIF: Average REF: Lesson 10-2
OBJ: 10-2.1 Recognize major arcs, minor arcs, semicircles, and central angles, and their measures.
STA: {Key}7.0
TOP: Recognize major arcs, minor arcs, semicircles, and central angles, and their measures.
KEY: Major Arcs | Minor Arcs | Semicircles | Central Angles MSC: Key

33. ANS:
140
$\angle CAE$ is equal to the sum of $\angle CAD$ and $\angle EAD$.

PTS: 1 DIF: Average REF: Lesson 10-2
OBJ: 10-2.1 Recognize major arcs, minor arcs, semicircles, and central angles, and their measures.
STA: {Key}7.0
TOP: Recognize major arcs, minor arcs, semicircles, and central angles, and their measures.
KEY: Major Arcs | Minor Arcs | Semicircles | Central Angles MSC: Key

34. ANS:
130
$\angle DAF$ is equal to the sum of $\angle DAE$ and $\angle FAE$..

PTS: 1 DIF: Average REF: Lesson 10-2
OBJ: 10-2.1 Recognize major arcs, minor arcs, semicircles, and central angles, and their measures.
STA: {Key}7.0
TOP: Recognize major arcs, minor arcs, semicircles, and central angles, and their measures.
KEY: Major Arcs | Minor Arcs | Semicircles | Central Angles MSC: Key

35. ANS:
48
Since $\overline{BE}$ is a diameter, $m\angle BFA + m\angle AFE = 180$. Solve the equation, then substitute the value of x to find $m\angle BFA$. Since $\angle BFA$ and $\angle EFC$ are vertical angles, they are congruent. Additionally, use the fact that m arc $DC = m\angle CFD = \frac{1}{2}m\angle CFE = \frac{1}{2}m\angle BFA$.

PTS: 1 DIF: Average REF: Lesson 10-2 OBJ: 10-2.2 Find arc length.
STA: {Key}7.0 TOP: Find arc length. KEY: Arcs | Arc Length
MSC: Key

36. ANS:
24
Since $\overline{AF}$, $\overline{EF}$ and $\overline{AE}$ form a right triangle, you can use the Pythagorean Theorem to find $m\overline{EF}$. Since $\overline{CF}$ is a segment that passes through the center of the circle and is perpendicular to chord $\overline{EG}$, it also bisects $\overline{EG}$. That means $m\overline{EG} = 2 \times m\overline{EF}$.

PTS: 1 DIF: Average REF: Lesson 10-3
OBJ: 10-3.1 Recognize and use relationships between arcs and chords.
STA: {Key}7.0 | {Key}21.0
TOP: Recognize and use relationships between arcs and chords.
KEY: Arcs | Chords | Diameters MSC: Key

37. ANS:
20
Since $\overline{UQ}$ and $\overline{US}$ are congruent and perpendicular to separate chords, the chords $\overline{PR}$ and $\overline{TR}$ must also be congruent. Additionally, $\overline{UQ}$ and $\overline{US}$ bisect these chords, so $TS = RS$. So take the given measure of $\overline{TS}$ and double it. That will be the measure of $\overline{TR}$ and also $\overline{PR}$.

PTS: 1 DIF: Average REF: Lesson 10-3
OBJ: 10-3.1 Recognize and use relationships between arcs and chords.
STA: {Key}7.0 | {Key}21.0
TOP: Recognize and use relationships between arcs and chords.
KEY: Arcs | Chords | Diameters MSC: Key

38. ANS:
41
$m\angle B = 90$ since it is inscribed in a semicircle. Since the sum of the angles in any triangle is 180°, $m\angle 1 + m\angle 2 = 90$. Substitute the given values for $\angle 1$ and $\angle 2$ into that equation. Then substitute the value found for x into the expression for $\angle 1$.

PTS: 1 DIF: Average REF: Lesson 10-4
OBJ: 10-4.1 Find measures of inscribed angles. STA: {Key}7.0 | {Key}21.0
TOP: Find measures of inscribed angles. KEY: Inscribed Angles | Measure of Inscribed Angles
MSC: Key

39. ANS:
38
First note that m arc $BC = m\angle BZC$ because a central angle of a circle is always congruent to its intercepted arc. Secondly, $m\angle BAC$ is one-half m arc BC, as the measure of an inscribed angle is half the measure of its intercepted arc. Since $\overline{AB} \parallel \overline{DC}$, $\angle DCA \cong \angle BAC$ because alternate interior angles are congruent. So $m\angle DCA = m\angle BAC$.

PTS: 1 DIF: Average REF: Lesson 10-4
OBJ: 10-4.2 Find measures of angles of inscribed polygons. STA: {Key}7.0 | {Key}21.0
TOP: Find measures of angles of inscribed polygons.
KEY: Inscribed Polygons | Measure of Inscribed Angles MSC: Key

40. ANS:
20
The triangle shown is a right triangle since the tangent segment, FE, intersects a radius, DE, which always results in a right angle. So to solve for x, use the Pythagorean Theorem. Note that $m\overline{DE} = x$ since they are both radii of the same circle.

PTS: 1 DIF: Average REF: Lesson 10-5
OBJ: 10-5.1 Use properties of tangents. STA: {Key}7.0 | {Key}21.0
TOP: Use properties of tangents. KEY: Tangents MSC: Key

41. ANS:
7
Recall that two tangents from the same external point are congruent. So, for example, $m\overline{HN} = m\overline{HJ}$ and $m\overline{KJ} = m\overline{KL}$. Those two equalities, plus the fact that $m\overline{HK} = m\overline{HJ} + m\overline{JK}$ allows us to make the equality $m\overline{HK} = m\overline{HN} + m\overline{KL}$. Substitute the appropriate values into that equation and solve for x.

PTS: 1 DIF: Average REF: Lesson 10-5
OBJ: 10-5.2 Solve problems involving circumscribed polygons. STA: {Key}7.0 | {Key}21.0
TOP: Solve problems involving circumscribed polygons. KEY: Circumscribed Polygons
MSC: Key

42. ANS:
112.5
When two secants intersect in the interior of a circle, then the measure of an angle formed by this intersection is equal to one-half the sum of the measures of the arcs intercepted by the angle and its vertical angle. In this diagram, the measure of one of the intercepted arcs for $\angle 5$ is not given, but it can be found since the sum of all of the arcs must be 360. Subtracting the sum of the other 3 arcs from 360, leaves 110.

PTS: 1 DIF: Basic REF: Lesson 10-6
OBJ: 10-6.1 Find measures of angles formed by lines intersecting on or inside a circle.
STA: {Key}7.0 | {Key}21.0
TOP: Find measures of angles formed by lines intersecting on or inside a circle.
KEY: Measure of Angles | Circles MSC: Key

43. ANS:
90
When two secants intersect in the interior of a circle, then the measure of an angle formed by this intersection is equal to one-half the sum of the measures of the arcs intercepted by the angle and its vertical angle. In this diagram the measures of the intercepted arcs for $\angle 7$ are not given. However, the full circle measures 360°, so $2x° + 2x° + 4x° + 4x° = 360°$. Solving this equation, $x = 30°$. So the intercepted arcs for $\angle 7$ are 60° and 120°.

PTS: 1 DIF: Average REF: Lesson 10-6
OBJ: 10-6.1 Find measures of angles formed by lines intersecting on or inside a circle.
STA: {Key}7.0 | {Key}21.0
TOP: Find measures of angles formed by lines intersecting on or inside a circle.
KEY: Measure of Angles | Circles MSC: Key

44. ANS:
70
When a secant intersects a tangent at the point of tangency, then the measure of the angle formed is one-half the measure of the intercepted arc. In this diagram, the measure of the intercepted arc for $\angle 10$ is 140 since $360 - 220 = 140$.

PTS: 1 DIF: Average REF: Lesson 10-6
OBJ: 10-6.1 Find measures of angles formed by lines intersecting on or inside a circle.
STA: {Key}7.0 | {Key}21.0
TOP: Find measures of angles formed by lines intersecting on or inside a circle.
KEY: Measure of Angles | Circles MSC: Key

45. ANS:
15
When two secants intersect in the exterior of a circle, then the measure of the angle formed is equal to one-half the positive difference of the measures of the intercepted arcs.

PTS: 1 DIF: Average REF: Lesson 10-6
OBJ: 10-6.2 Find measures of angles formed by lines intersecting outside the circle.
STA: {Key}7.0 | {Key}21.0
TOP: Find measures of angles formed by lines intersecting outside the circle.
KEY: Measure of Angles | Circles MSC: Key

46. ANS:
22
When a secant and tangent intersect in the exterior of a circle, then the measure of the angle formed is equal to one-half the positive difference of the measures of the intercepted arcs.

PTS: 1 DIF: Average REF: Lesson 10-6
OBJ: 10-6.2 Find measures of angles formed by lines intersecting outside the circle.
STA: {Key}7.0 | {Key}21.0
TOP: Find measures of angles formed by lines intersecting outside the circle.
KEY: Measure of Angles | Circles MSC: Key

47. ANS:
9
The products of the segments for each intersecting chord are equal.

PTS: 1 DIF: Basic REF: Lesson 10-7
OBJ: 10-7.1 Find measures of segments that intersect in the interior of a circle.
STA: {Key}7.0 | {Key}21.0
TOP: Find measures of segments that intersect in the interior of a circle.
KEY: Circles | Interior of Circles MSC: Key

48. ANS:
10
When a secant segment and a tangent segment intersect in the exterior of a circle, set the product of each external part of the secant segment and the entire secant segment equal to the square of the tangent segment.

PTS: 1 DIF: Average REF: Lesson 10-7
OBJ: 10-7.2 Find measures of segments that intersect in the exterior of a circle.
STA: {Key}7.0 | {Key}21.0
TOP: Find measures of segments that intersect in the exterior of a circle.
KEY: Circles | Exterior of Circles MSC: Key

49. ANS:
$(x-3)^2+(y+7)^2=144$
The equation of a circle is $(x-h)^2+(y-k)^2=r^2$ where (h, k) is the center and r is the radius. In this problem, the center is given, but not the radius. The radius is one-half the diameter, so first divide the given diameter by 2 to get the radius.

PTS: 1 DIF: Average REF: Lesson 10-8
OBJ: 10-8.1 Write the equation of a circle. STA: {Key}17.0
TOP: Write the equation of a circle. KEY: Circles | Equation of Circles
MSC: Key

50. ANS:
$(x+5)^2+(y-4)^2=13$
The equation of a circle is $(x-h)^2+(y-k)^2=r^2$ where (h, k) is the center and r is the radius. The center is the midpoint of the endpoints of the diameter. Use the distance formula to find the diameter, which is the distance between the endpoints. The radius is one-half the diameter, so the divide the diameter by 2 to get the radius.

PTS: 1 DIF: Average REF: Lesson 10-8
OBJ: 10-8.1 Write the equation of a circle. STA: {Key}17.0
TOP: Write the equation of a circle. KEY: Circles | Equation of Circles
MSC: Key