

Algebra II Practice Quiz 10.1 - 10.2**Multiple Choice**

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

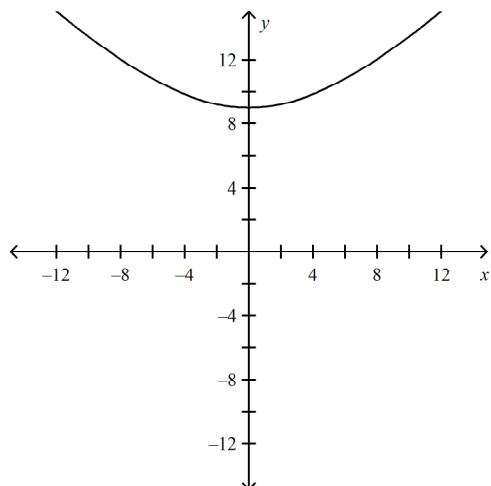
- _____ 1. Graph $16x^2 + 4y^2 = 64$ on a graphing calculator. Identify the conic section. Then, describe the center and intercepts.
- a. Hyperbola with center (0, 0) and intercepts (2, 0) and (-2, 0).
 - b. Ellipse with center (0, 0) and intercepts (4, 0), (-4, 0), (0, 8), and (0, -8).
 - c. Circle with center (0, 0) and intercepts (8, 0), (-8, 0), (0, 8), and (0, -8).
 - d. Ellipse with center (0, 0) and intercepts (2, 0), (-2, 0), (0, 4), and (0, -4).

Name: _____

ID: A

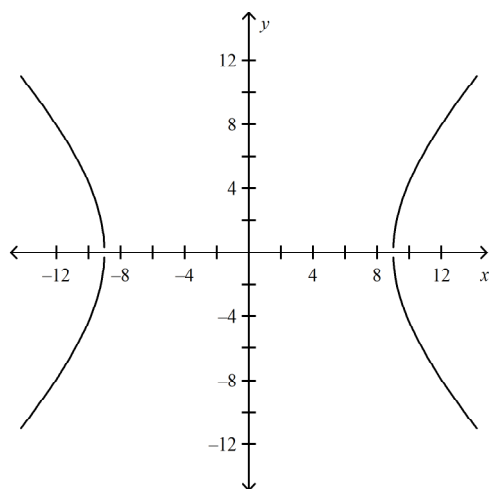
- _____ 2. Graph $y^2 - x^2 = 81$ on a graphing calculator. Identify the conic section. Then, find the vertex or vertices and the direction the graph opens.

a.



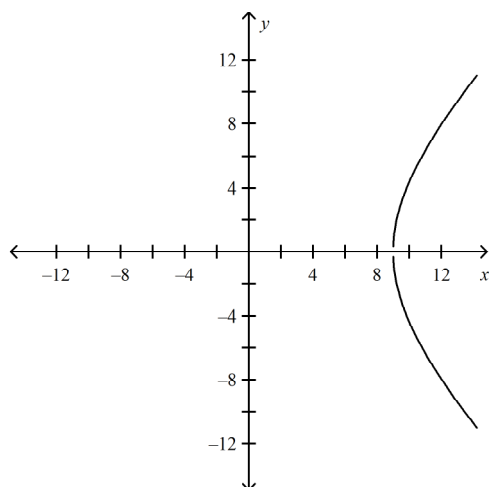
The graph is a parabola that opens vertically with a vertex at $(0, 9)$.

b.



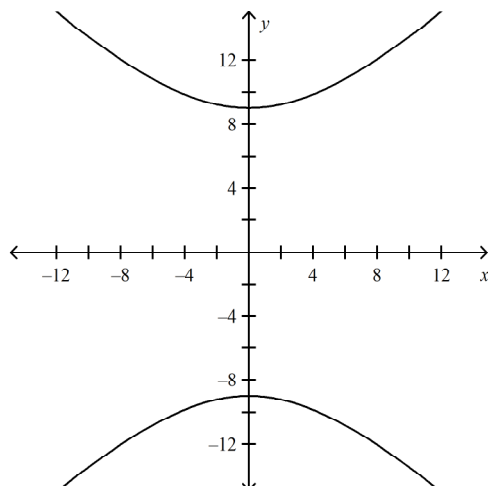
The graph is a hyperbola that opens horizontally with vertices at $(9, 0)$ and $(-9, 0)$.

c.



The graph is a parabola that opens horizontally with a vertex at $(9, 0)$.

d.

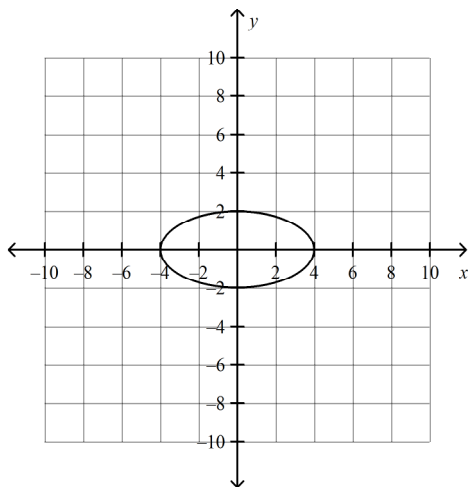


The graph is a hyperbola that opens vertically with vertices at $(0, 9)$ and $(0, -9)$.

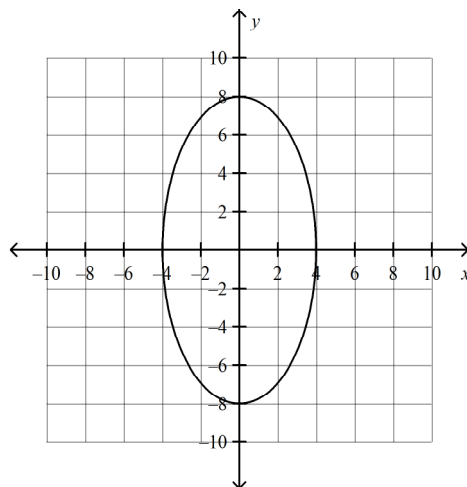
- _____ 3. Find the center and radius of a circle that has a diameter with endpoints $(-9, -6)$ and $(-1, 0)$.
- | | |
|--------------------------------|-----------------------------------|
| a. center $(4, 3)$; radius 5 | c. center $(-5, -3)$; radius 5 |
| b. center $(8, 6)$; radius 10 | d. center $(-10, -6)$; radius 10 |

_____ 4. Graph the equation $4x^2 + 16y^2 = 64$.

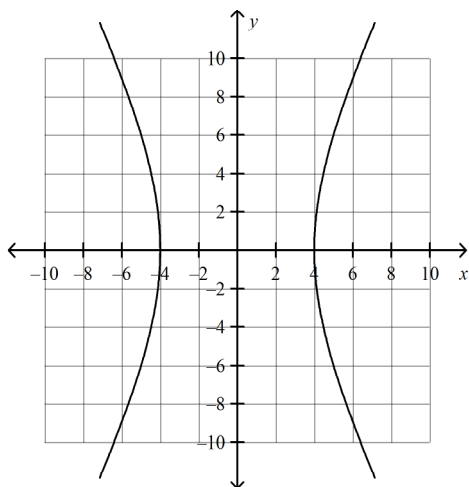
a.



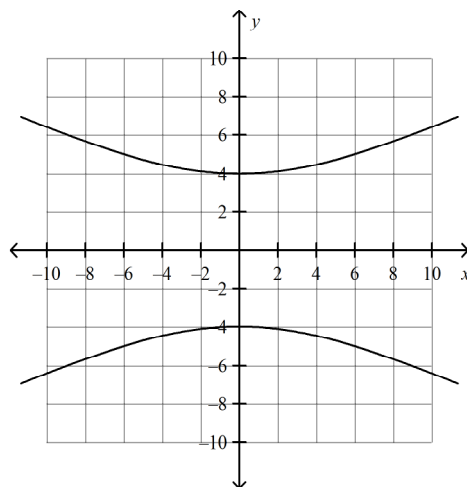
c.



b.



d.



_____ 5. Write the equation of a circle with center $(8, 7)$ and radius $r = 6$.

a. $36 = (x - 8)^2 + (y - 7)^2$

c. $6 = (x - 8) + (y - 7)$

b. $6 = (x - 8)^2 + (y - 7)^2$

d. $36 = (x - 7)^2 + (y - 8)^2$

_____ 6. Write the equation of the circle with center $(2, 4)$ and containing the point $(-2, 1)$.

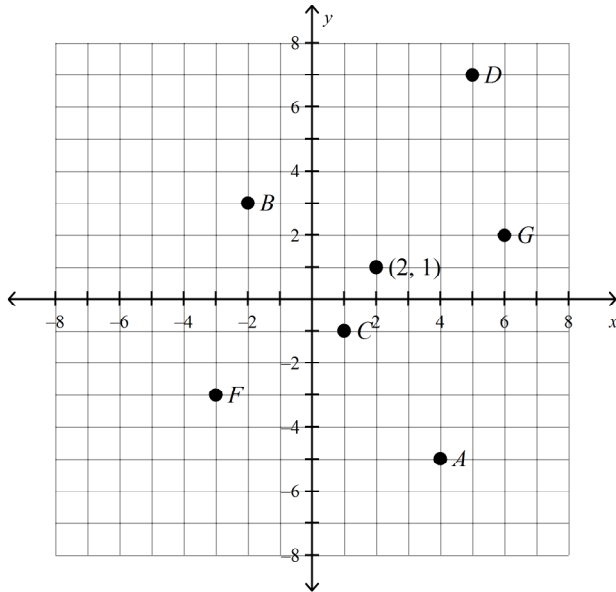
a. $(x + 2)^2 + (y - 1)^2 = 25$

c. $(x - 2)^2 + (y - 4)^2 = 5$

b. $(x - 2)^2 + (y - 4)^2 = 25$

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

- _____ 7. Sandra and her friends want to walk to the store. They only visit stores that are less than 500 yards away from Sandra's house. Sandra's house is at the point $(2, 1)$, the letters represent all of the local stores, and each unit represents 100 yards. Use the equation of a circle to find the number of stores that are within 500 yards of Sandra's house.



- a. 2 stores
b. 3 stores
c. 4 stores
d. 5 stores
- _____ 8. Write the equation of the line that is tangent to the circle $25 = x^2 + y^2$ at the point $(3, 4)$.
- a. $\frac{x}{3} + \frac{y}{4} = 25$
b. $y = \frac{3}{4}x + \frac{25}{4}$
c. $y = -\frac{3}{4}x + \frac{25}{4}$
d. $(3y)(4x) = 5$
- _____ 9. The lines $y = -2x + 1$ and $y = 5x + 22$ each contain diameters of a particular circle. If the point $(5, 11)$ is on the circle, find the equation of the circle.
- a. $(x - 5)^2 + (y - 11)^2 = 146$
b. $(x - 3)^2 + (y + 7)^2 = 328$
c. $(x - 3)^2 + (y - 23)^2 = 148$
d. $(x + 3)^2 + (y - 7)^2 = 80$

Algebra II Practice Quiz 10.1 - 10.2

Answer Section

MULTIPLE CHOICE

1. ANS: D

Step 1 Solve for y so the expression can be used in a graphing calculator.

$$4y^2 = 64 - 16x^2$$

Subtract $16x^2$ from both sides.

$$y^2 = \frac{64 - 16x^2}{4}$$

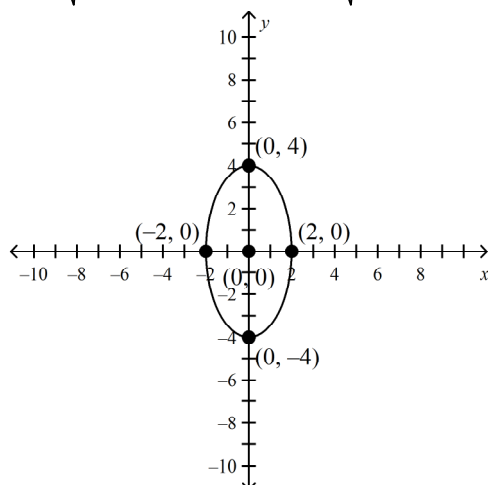
Divide both sides by 4.

$$y = \pm \sqrt{\frac{64 - 16x^2}{4}}$$

Take the square root of both sides.

Step 2 Use two equations to see the complete graph.

$$y = \sqrt{\frac{64 - 16x^2}{4}} \text{ and } y = -\sqrt{\frac{64 - 16x^2}{4}}$$



The graphs meet to form a complete ellipse, even though it may not appear that way on a graphing calculator.

The graph is an ellipse with center $(0, 0)$ and intercepts $(2, 0)$, $(-2, 0)$, $(0, 4)$, and $(0, -4)$.

	Feedback
A	Check the equation you used to graph the conic section.
B	Check the y -intercepts on the graph. What are the values of y when $x = 0$?
C	Check the intercepts on the graph. What are the values of y when $x = 0$? What are the values of x when $y = 0$?
D	Correct!

PTS: 1 DIF: Average REF: Page 722

OBJ: 10-1.1 Graphing Circles and Ellipses on a Calculator

TOP: 10-1 Introduction to Conic Sections

2. ANS: D

Step 1 Solve for y.

$$y^2 = x^2 + 81$$

$$y = \pm\sqrt{x^2 + 81}$$

Step 2 Use two equations to see the complete graph.

$$y_1 = \sqrt{x^2 + 81} \text{ and } y_2 = -\sqrt{x^2 + 81}$$

	Feedback
A	Both variables are squared, so this is not a parabola.
B	Solve for y, then graph.
C	Both variables are squared, so this is not a parabola.
D	Correct!

PTS: 1 DIF: Average REF: Page 723

OBJ: 10-1.2 Graphing Parabolas and Hyperbolas on a Calculator

TOP: 10-1 Introduction to Conic Sections

3. ANS: C

Step 1 Use the midpoint formula to find the center.

$$\left(\frac{-9 + -1}{2}, \frac{-6 + 0}{2} \right) = (-5, -3)$$

The center is $(-5, -3)$.

Step 2 Use the Distance Formula with $(-5, -3)$ and $(-9, -6)$ to find the radius.

$$r = \sqrt{(-5 - (-9))^2 + (-3 - (-6))^2} = 5$$

The radius is 5.

	Feedback
A	The center is the midpoint between the given endpoints.
B	To find the center, add the x-values and divide by 2, and add the y-values and divide by 2.
C	Correct!
D	To find the center, add the x-values and divide by 2, and add the y-values and divide by 2.

PTS: 1 DIF: Basic REF: Page 725

OBJ: 10-1.3 Finding the Center and Radius of a Circle

TOP: 10-1 Introduction to Conic Sections

4. ANS: A

Use a graphing calculator to graph the equation. Use a square window on your graphing calculator for an accurate graph. The graph is an ellipse with center (0, 0) and intercepts (−4, 0), (4, 0), (0, −2), and (0, 2).

	Feedback
A	Correct!
B	Use a graphing calculator to graph the equation.
C	Use a graphing calculator to graph the equation.
D	Use a graphing calculator to graph the equation.

PTS: 1

DIF: Advanced

TOP: 10-1 Introduction to Conic Sections

5. ANS: A

Use the Distance Formula with $(x_2, y_2) = (x, y)$, $(x_1, y_1) = (8, 7)$, and distance equal to the radius, 6.

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \quad \text{Use the Distance Formula.}$$

$$6 = \sqrt{(x_2 - 8)^2 + (y_2 - 7)^2} \quad \text{Substitute.}$$

$$6^2 = (x_2 - 8)^2 + (y_2 - 7)^2 \quad \text{Square both sides.}$$

$$36 = (x_2 - 8)^2 + (y_2 - 7)^2$$

	Feedback
A	Correct!
B	Square both sides.
C	Square both sides. Also, when you square an expression that is a square root, the result is the radicand.
D	You reversed the values of x and y .

PTS: 1

DIF: Basic

REF: Page 729

OBJ: 10-2.1 Using the Distance Formula to Write the Equation of a Circle

TOP: 10-2 Circles

6. ANS: B

$$r = \sqrt{(-2-2)^2 + (1-4)^2}$$

Use the Distance Formula to find the radius.

$$r = \sqrt{(-4)^2 + (-3)^2} = \sqrt{25} = 5$$

$$(x-2)^2 + (y-4)^2 = 5^2$$

Substitute the values into the equation of a circle.

$$(x-2)^2 + (y-4)^2 = 25$$

	Feedback
A	The equation of a circle is $(x-h)^2 + (y-k)^2 = r^2$, where (h, k) is the center of the circle.
B	Correct!
C	The equation of a circle is $(x-h)^2 + (y-k)^2 = r^2$ is the square of the radius.
D	The equation of a circle is $(x-h)^2 + (y-k)^2 = r^2$, where (h, k) is the center of the circle and r^2 is square of the radius.

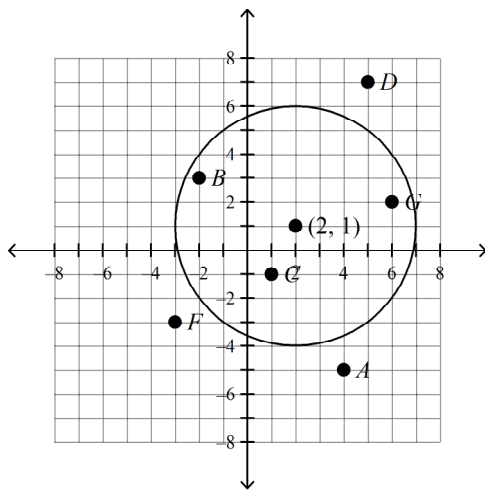
PTS: 1 DIF: Average REF: Page 730

OBJ: 10-2.2 Writing the Equation of a Circle

TOP: 10-2 Circles

7. ANS: B

The circle has center $(2, 1)$ with a radius of 5. The points inside the circle will satisfy the inequality $(x - 2)^2 + (y - 1)^2 < 5^2$



Points B, C, and G are within the 500-yard boundary.

	Feedback
A	Draw a circle of radius 5 and center $(2, 1)$, and see how many stores are inside the circle.
B	Correct!
C	Draw a circle of radius 5 and center $(2, 1)$, and see how many stores are inside the circle.
D	Draw a circle of radius 5 and center $(2, 1)$, and see how many stores are inside the circle.

PTS: 1 DIF: Average OBJ: 10-2.3 Application
TOP: 10-2 Circles

8. ANS: C

Step 1 Identify center and radius of the circle.From the equation $25 = x^2 + y^2$, the circle has center (0,0) and radius 5.**Step 2** Find the slope of the radius at the point of tangency and the slope of the tangent.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{+4 - 0}{3 - 0}$$

Use the slope formula.

$$m = \frac{4}{3}$$

The slope of the radius is $\frac{4}{3}$.

The tangent is perpendicular to the radius. Because the slopes of perpendicular lines are negative reciprocals, the slope of the tangent is $-\frac{3}{4}$.

Step 3 Find the slope-intercept equation of the tangent by using the point (3,4)and the slope $-\frac{3}{4}$.

$$y - y_1 = m(x - x_1)$$

Use the point-slope formula.

$$(y - 4) = -\frac{3}{4}(x - 3)$$

$$y = -\frac{3}{4}x + \frac{25}{4}$$

Rewrite in slope-intercept form.

	Feedback
A	The slope of the radius is perpendicular to the slope of the tangent. Find the slope of the tangent and use the point-slope formula to find its equation.
B	Perpendicular slopes are negative reciprocals.
C	Correct!
D	The slope of the radius is perpendicular to the slope of the tangent. Find the slope of the tangent and use the point-slope formula to find its equation.

PTS: 1 DIF: Average REF: Page 731

OBJ: 10-2.4 Writing the Equation of a Tangent

TOP: 10-2 Circles

9. ANS: D

If two different lines contain the diameters of the circle, they intersect at the circle's center. Solve the system to find the point of intersection.

$$-2x + 1 = 5x + 22$$

$$7x = -21$$

$$x = -3$$

Set the two equations equal to each other, as they both are equal to y .

Solve for x .

$$y = -2(-3) + 1 = 7$$

Substitute for x in one equation.

The center of the circle is $(-3, 7)$.

$$(x + 3)^2 + (y - 7)^2 = r^2$$

Equation of the circle with center $(-3, 7)$ and radius r

$$(5 + 3)^2 + (11 - 7)^2 = r^2$$

Substitute $(5, 11)$ for (x, y) .

$$80 = r^2$$

Simplify.

$$(x + 3)^2 + (y - 7)^2 = 80$$

Substitute r^2 into the equation of the circle.

	Feedback
A	The point $(5, 11)$ is on the circumference; it is not the center of the circle.
B	In the equation of the circle, use the difference of the coordinates squared, not the sum squared.
C	Solve for the intersection of the two lines to determine the center of the circle.
D	Correct!

PTS: 1

DIF: Advanced

TOP: 10-2 Circles