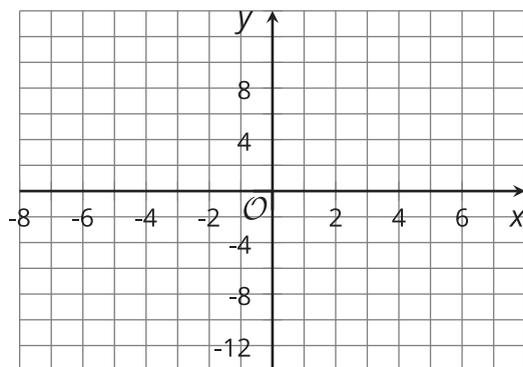


Lesson 16 Practice Problems

1. Which equation can be represented by a graph with a vertex at $(1, 3)$?
 - A. $y = (x - 1)^2 + 3$
 - B. $y = (x + 1)^2 + 3$
 - C. $y = (x - 3)^2 + 1$
 - D. $y = (x + 3)^2 + 1$

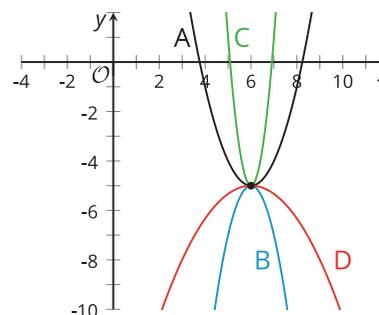
2.
 - a. Where is the vertex of the graph that represents $y = (x - 2)^2 - 8$?
 - b. Where is the y -intercept? Explain how you know.
 - c. Identify one other point on the graph of the equation. Explain or show how you know.
 - d. Sketch a graph that represents the equation.



3. The function v is defined by $v(x) = \frac{1}{2}(x + 5)^2 - 7$.

Without graphing, determine if the vertex of the graph representing v shows the minimum or maximum value of the function. Explain how you know.

4. Match each graph to an equation that represents it.



A. Graph A

1. $y = -2(x - 6)^2 - 5$

B. Graph B

2. $y = (x - 6)^2 - 5$

C. Graph C

3. $y = 6(x - 6)^2 - 5$

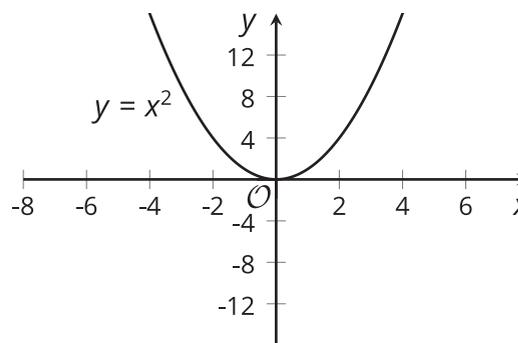
D. Graph D

4. $y = -\frac{1}{3}(x - 6)^2 - 5$

5. Here is a graph that represents $y = x^2$.

a. Describe what would happen to the graph if the original equation was changed to:

i. $y = \frac{1}{2}x^2$

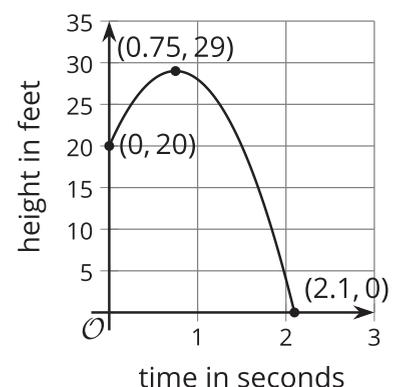


ii. $y = x^2 - 8$

b. Graph the equation $y = \frac{1}{2}x^2 - 8$ on the same coordinate plane as $y = x^2$.

(From Unit 6, Lesson 12.)

6. Clare throws a rock into the lake. The graph shows the rock's height above the water, in feet, as a function of time in seconds.



Select **all** the statements that describe this situation.

- A. The vertex of the graph is $(0.75, 29)$.
- B. The y -intercept of the graph is $(2.1, 0)$.
- C. Clare just dropped the rock into the lake.
- D. The maximum height of the rock is about 20 feet.
- E. The rock hits the surface of the water after about 2.1 seconds.
- F. Clare tossed the rock up into the air from a point 20 feet above the water.

(From Unit 6, Lesson 14.)

7. *Technology required.* Two objects are launched into the air.

- The height, in feet, of Object A is given by the equation $f(t) = 4 + 32t - 16t^2$.
- The height, in feet, of the Object B is given by the equation $g(t) = 2.5 + 40t - 16t^2$. In both functions, t is seconds after launch.

Use technology to graph each function in the same graphing window.

- a. What is the maximum height of each object?
- b. Which object hits the ground first? Explain how you know.

(From Unit 6, Lesson 14.)

8. Andre thinks the vertex of the graph of the equation $y = (x + 2)^2 - 3$ is $(2, -3)$. Lin thinks the vertex is $(-2, 3)$. Do you agree with either of them?

(From Unit 6, Lesson 15.)

9. The expression $2,000 \cdot (1.015^{12})^5$ represents the balance, in dollars, in a savings account.
- What is the rate of interest paid on the account?
 - How many years has the account been accruing interest?
 - How much money was invested?
 - How much money is in the account now?
 - Write an equivalent expression to represent the balance in the savings account.

(From Unit 5, Lesson 17.)