

Name _____

8A: Algebra 1

Date _____

Period _____

Quadratic Functions Day II

1. A quadratic function is a function that can be written in the standard form:

$$y = ax^2 + bx + c, \text{ where } a \neq 0$$

2. Every quadratic function has a U-shaped graph called a _____.

3. If the leading coefficient a is positive, the parabola opens _____.

4. If the leading coefficient a is negative, the parabola opens _____.

5. The _____ is the lowest point (minimum) of a parabola that opens up and the highest point (maximum) of a parabola that opens down.

6. The vertical line passing through the vertex that divides the parabola into two symmetric parts is called the _____. Its' equation is always _____.

7. Solutions of quadratic functions can also be called the _____,
_____, or _____.

To find the Vertex and Axis of Symmetry Algebraically

1. Put the quadratic function in standard form: $y = ax^2 + bx + c$

2. Identify the numeric values of a , b , and c .

3. The vertex has an x -coordinate of $x = \frac{-b}{2a}$. Plug in the values for a and b .

4. Substitute whatever you get for x in step 3 into the quadratic function to find the y -coordinate of the vertex.

5. The axis of symmetry is the vertical line $x = \frac{-b}{2a}$

Examples 1-3: Find the vertex and Axis of Symmetry for these quadratic functions.

1) $y = -2x^2 + 4x - 9$

$a = \underline{\hspace{2cm}}$ $b = \underline{\hspace{2cm}}$ $c = \underline{\hspace{2cm}}$

Vertex:

Axis of Symmetry:

2) $y = x^2 - 10x$

$a = \underline{\hspace{2cm}}$ $b = \underline{\hspace{2cm}}$ $c = \underline{\hspace{2cm}}$

Vertex:

Axis of Symmetry:

3) $y = -1 + x^2 + 4x$

$a = \underline{\hspace{2cm}}$ $b = \underline{\hspace{2cm}}$ $c = \underline{\hspace{2cm}}$

Vertex:

Axis of Symmetry:

Name: _____

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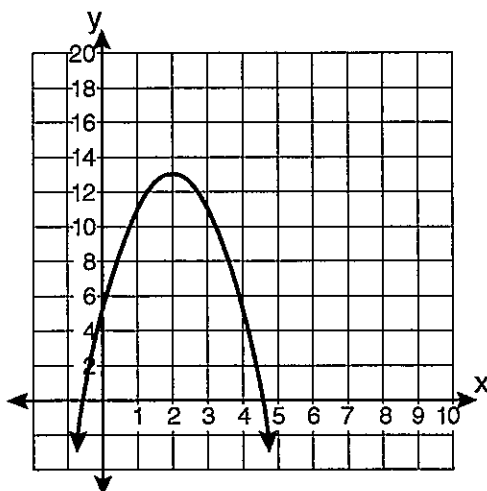
Quadratic Functions Classwork Extra Practice

1) Which one of the following equations represents a quadratic function?

- A) $y = x + 2$ C) $y = x^2$
B) $y = |x + 2|$ D) $y = 2x$

2) Find algebraically the equation of the axis of symmetry and the coordinates of the vertex of the parabola whose equation is $y = -2x^2 - 8x + 3$. [Show all work.]

3) What is the equation of the axis of symmetry of the parabola shown in the diagram below?



- A) $x = 2$ C) $x = 13$
B) $x = 4.5$ D) $x = -0.5$

4) What are the coordinates of the minimum point of a parabola whose equation is $y = x^2 + 3$?

- A) (-1,2) C) (0,3)
B) (3,12) D) (3,0)

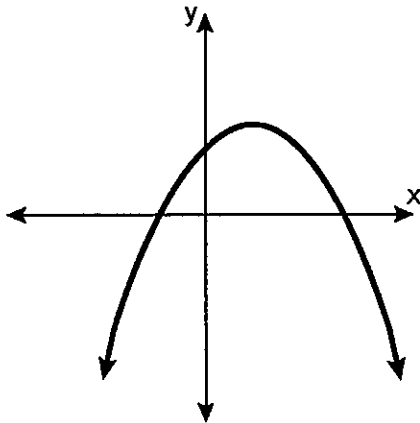
5) The height, y , of a ball tossed into the air can be represented by the equation $y = -x^2 + 10x + 3$, where x is the elapsed time. What is the equation of the axis of symmetry of this parabola?

- A) $x = 5$ C) $y = -5$
B) $x = -5$ D) $y = 5$

6) Consider the graph of the equation $y = ax^2 + bx + c$, when $a \neq 0$. If a is multiplied by 3, what is true of the graph of the resulting parabola?

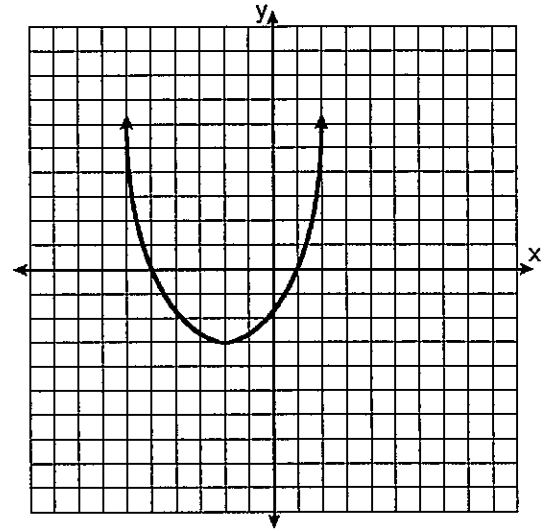
- A) The new parabola is narrower than the original parabola.
B) The vertex is 3 units above the vertex of the original parabola.
C) The new parabola is 3 units to the right of the original parabola.
D) The new parabola is wider than the original parabola.

- 7) What type of graph is shown in the diagram below?



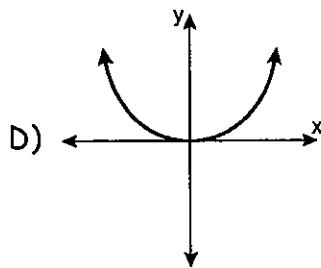
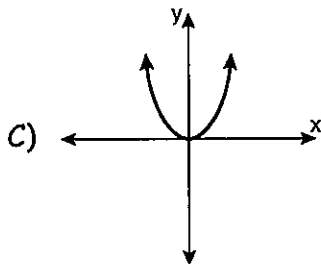
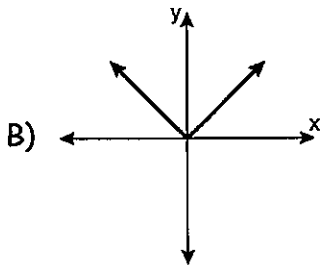
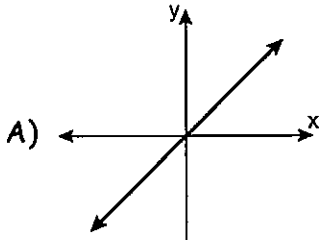
- A) exponential
- B) quadratic
- C) linear
- D) absolute value

- 8) What are the vertex and the axis of symmetry of the parabola shown in the diagram below?

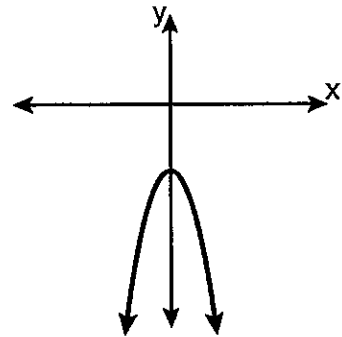


- A) The vertex is $(-2, -3)$, and the axis of symmetry is $x = -2$.
- B) The vertex is $(-3, -2)$, and the axis of symmetry is $x = -2$.
- C) The vertex is $(-3, -2)$, and the axis of symmetry is $y = -2$.
- D) The vertex is $(-2, -3)$, and the axis of symmetry is $y = -2$.

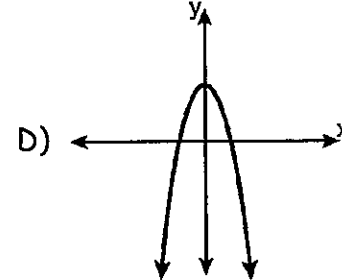
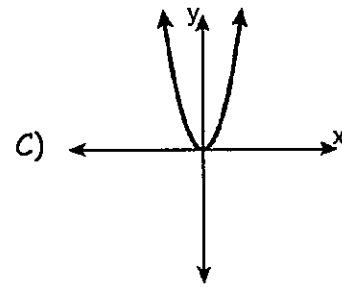
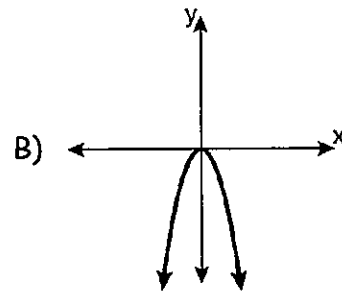
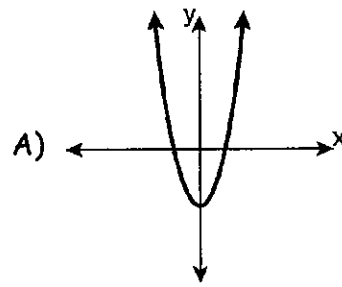
9) Which graph represents a linear function?



10) The diagram below shows the graph of $y = -x^2 - c$.

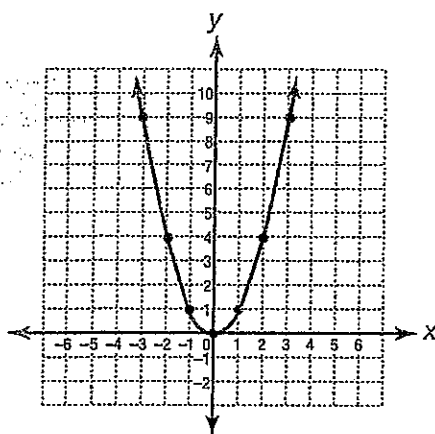


Which diagram shows the graph of $y = x^2 - c$?

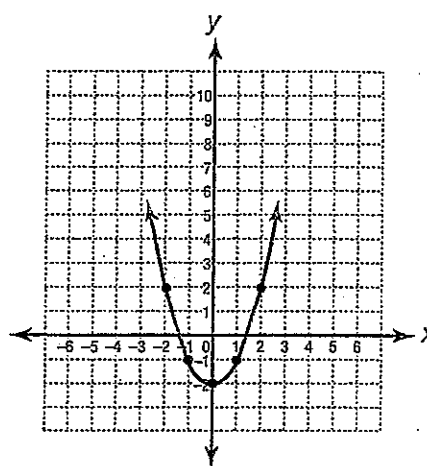


11) Which of the following is the graph of $y = x^2 + 2$?

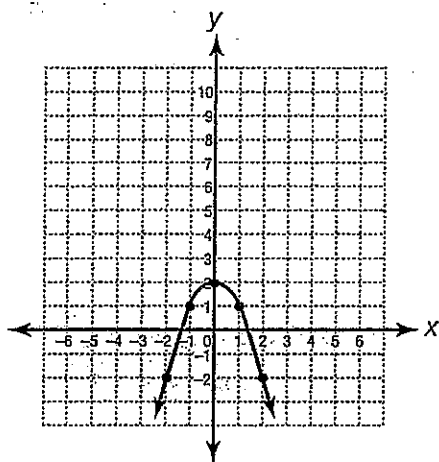
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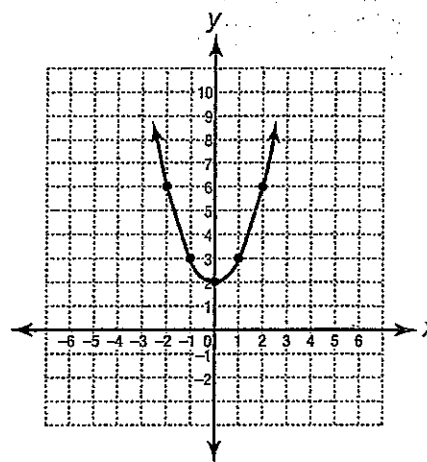
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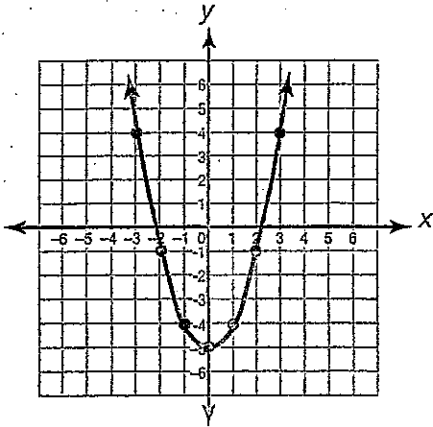


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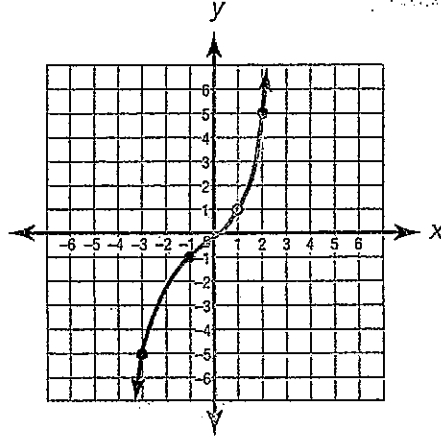


12) Which of the following is the graph of $y = -1x^2 + 5$?

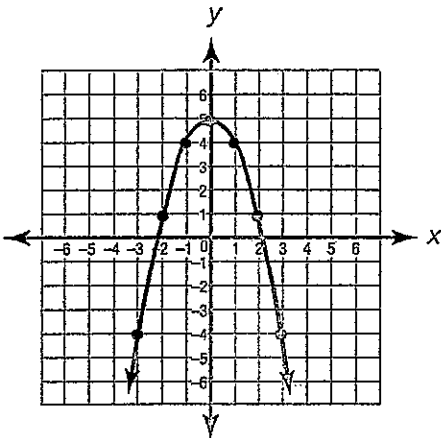
A



C



B



D

