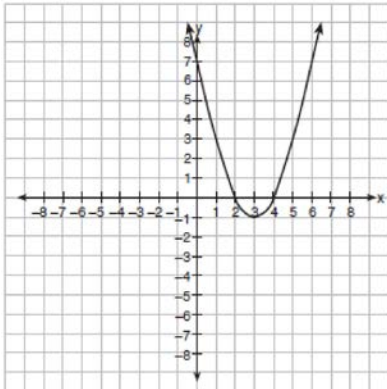


**F.IF.B.4: Graphing Quadratic Functions 2b**

- 1 Which is an equation of the line of symmetry for the parabola in the accompanying diagram?



- 2 Which is the equation of the axis of symmetry of the graph of the equation  $y = x^2 - 3x - 6$ ?
- 3 What are the coordinates of the turning point of the parabola whose equation is  $y = -x^2 + 4x + 1$ ?
- 4 What is the minimum point of the graph of the equation  $y = 2x^2 + 8x + 9$ ?
- 5 What is the turning point, or vertex, of the parabola whose equation is  $y = 3x^2 + 6x - 1$ ?
- 6 If the equation of the axis of symmetry of a parabola is  $x = 2$ , at which pair of points could the parabola intersect the  $x$ -axis?
- 1)  $(3,0)$  and  $(5,0)$
  - 2)  $(3,0)$  and  $(2,0)$
  - 3)  $(3,0)$  and  $(1,0)$
  - 4)  $(-3,0)$  and  $(-1,0)$
- 7 For which quadratic equation is the axis of symmetry  $x = 3$ ?
- 1)  $y = -x^2 + 3x + 5$
  - 2)  $y = -x^2 + 6x + 2$
  - 3)  $y = x^2 + 6x + 3$
  - 4)  $y = x^2 + x + 3$

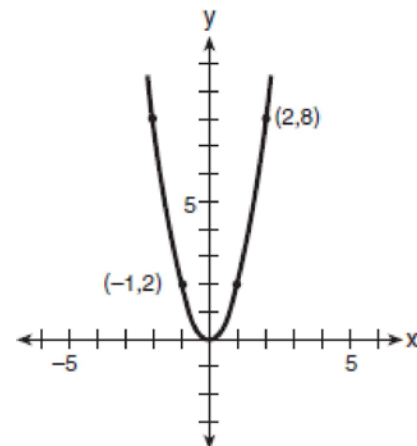
- 8 An equation of a parabola that has  $x = -2$  as its axis of symmetry is

- 1)  $y = x^2 - 4x + 1$
- 2)  $y = x^2 - 2x + 3$
- 3)  $y = 2x^2 + 8x - 3$
- 4)  $y = 2x^2 + 4x - 7$

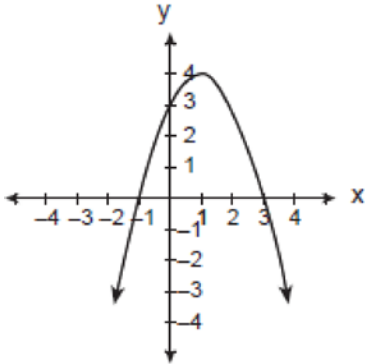
- 9 What is the equation of a parabola that goes through points  $(0, 1)$ ,  $(-1, 6)$ , and  $(2, 3)$ ?

- 10 Point  $A(1, 0)$  is a point on the graph of the equation  $y = x^2 - 4x + 3$ . When point  $A$  is reflected across the axis of symmetry, what are the coordinates of its image, point  $A'$ ?

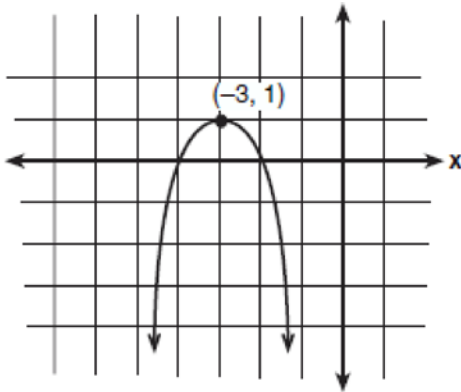
- 11 Which quadratic function is shown in the accompanying graph?



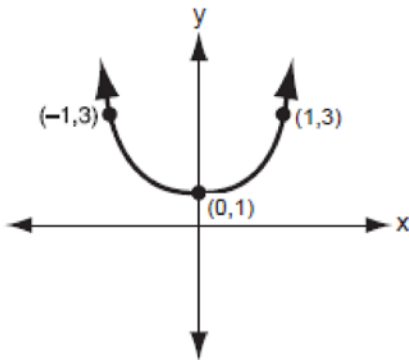
- 12 Which is an equation of the parabola shown in the accompanying diagram?



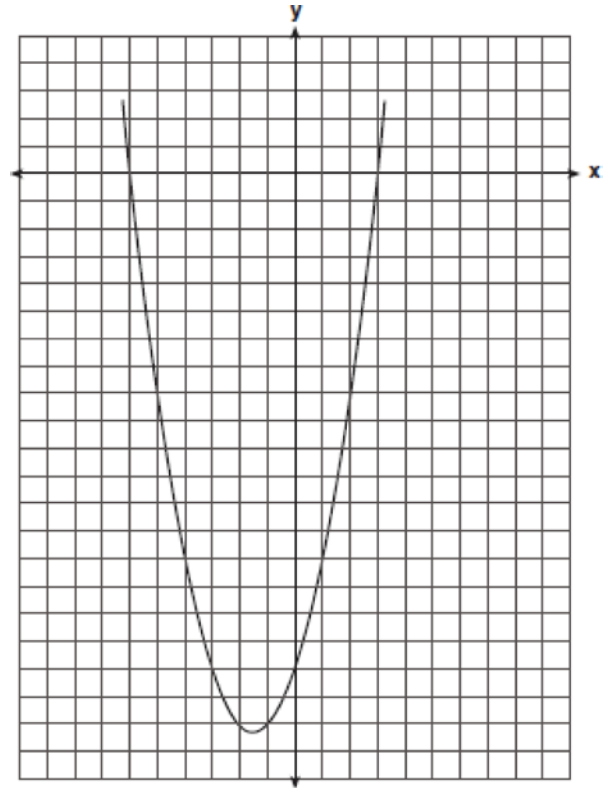
- 13 Which equation represents the parabola shown in the accompanying graph?



- 14 Which equation is represented by the accompanying graph?



- 15 The graph of a quadratic equation is shown in the accompanying diagram. The scale on the axes is a unit scale. Write an equation of this graph in standard form.



### F.IF.B.4: Graphing Quadratic Functions 2b Answer Section

- 1 ANS:  
 $x = 3$

REF: 010606a

- 2 ANS:

$$x = \frac{3}{2}$$

$$x = \frac{-b}{2a} = \frac{-(-3)}{2(1)} = \frac{3}{2}$$

REF: 061012b

- 3 ANS:  
(2,5)

$$x = \frac{-b}{2a} = \frac{-(4)}{2(-1)} = 2$$

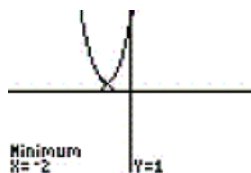
$$y = -(2)^2 + 4(2) + 1 = 5$$

REF: 080902b

- 4 ANS:  
(-2,1)

$$x = \frac{-b}{2a} = \frac{-(8)}{2(2)} = -2$$

$$y = 2(-2)^2 + 8(-2) + 9 = 1$$

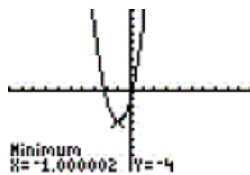


REF: 080603b

- 5 ANS:  
(-1,-4)

$$x = \frac{-b}{2a} = \frac{-(6)}{2(3)} = -1$$

$$y = 3(-1)^2 + 6(-1) - 1 = -4$$



REF: 080501b

6 ANS: 3

The axis of symmetry of a parabola intersecting the x-axis at two points goes through the midpoint of the line segment connecting those two points. The midpoint of (3,0) and (1,0) is (2,0).

REF: 080912b

7 ANS: 2

$$x = \frac{-b}{2a} = \frac{-(6)}{2(-1)} = 3$$

REF: 060514b

8 ANS: 3

REF: 011004b

9 ANS:

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

X	Y1
0	1
1	0
2	1
3	0
4	1
5	0
6	1
7	0
8	1
9	0

X=-1

. You can also use a graphing calculator's STAT function, input the three ordered pairs, and

L1	L2	L3	Z	QuadReg
0	1			$y=ax^2+bx+c$
-1	0			$a=2$
	1			$b=-3$
				$c=1$
L2(4) =				

calculate the quadratic regression line of best fit.

REF: 060209b

10 ANS:

(3,0)

The axis of symmetry of  $y = x^2 - 4x + 3$  is:  $x = \frac{-b}{2a} = \frac{-(-4)}{2(1)} = 2$ . The reflection of point A(1,0) over the line  $x = 2$  is point A'(3,0).

REF: 060908b

11 ANS:

$$y = 2x^2$$

Since the parabola is cupped up,  $a > 0$ , eliminating (1) and (3). The point (2, 8) satisfies only  $y = 2x^2$ . You can also use a graphing calculator's STAT function, input at least three ordered pairs, and calculate the quadratic

L1	L2	L3	Z	QuadReg
-1	2			$y=ax^2+bx+c$
0	0			$a=2$
1	2			$b=0$
				$c=0$
L2(5) =				

regression line of best fit.

REF: 060404b

12 ANS:

$$y = -x^2 + 2x + 3$$

Since the parabola is cupped down,  $a < 0$ , eliminating (3) and (4). Based upon the graph, the axis of symmetry is  $x$

$$x = \frac{-b}{2a}$$

$$= 1. \quad x = \frac{-(2)}{2(-1)}$$

$$x = 1$$

REF: 080017a

13 ANS:

$$f(x) = -(x+3)^2 + 1$$

When the equation of a quadratic is in vertex form,  $y = a(x-h)^2 + k$ ,  $(h, k)$  is the vertex.

REF: 010303b

14 ANS:

$$y = 2x^2 + 1$$

REF: 010801b

15 ANS:

$$y = (x+6)(x-3)$$

$y = x^2 + 3x - 18$ .  $a > 0$ , the  $y$ -intercept is  $-18$ , and the roots are  $-6$  and  $3$ .  $y = x^2 + 6x - 3x - 18$ . You can

$$y = x^2 + 3x - 18$$

also use a graphing calculator's STAT function, input at least three ordered pairs, and calculate the quadratic

L1	L2	L3	Z
-6	0	-----	
0	-18		
3	0	-----	
-----	-----	-----	

QuadReg  
 $y = ax^2 + bx + c$   
 $a = 1$   
 $b = 3$   
 $c = -18$

regression line of best fit.  $L2(4) =$  .

REF: 010328a