

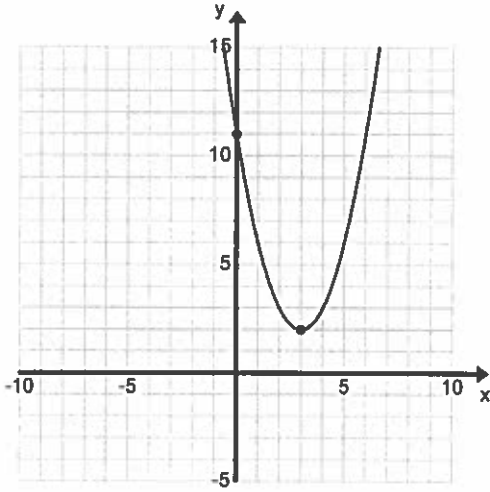
19

Name Key

### Quadratic Functions Quiz 2

Multiple Choice & Numeric Response. 1 mark each.

1. Which set of data is correct for this graph?



Vertex (3, 2)  
sym  $x=3$

$y \geq 2$

	Axis of Symmetry	Vertex	Range
<input checked="" type="radio"/> A.	$x = 3$	(3, 2)	$y \geq 2$
<input type="radio"/> B.	$x = 3$	(3, 2)	$y \leq 2$
<input type="radio"/> C.	$x = 2$	(2, 3)	$y \geq 3$
<input type="radio"/> D.	$x = 2$	(2, 3)	$y \leq 3$

downward.  
 $\sqrt{(-20, 14)}$   
 $x = -20$

2. Which set of data is correct for the quadratic function:  $y = -(x + 20)^2 + 14$  ?

	Direction parabola opens	Vertex	Axis of Symmetry
<input type="radio"/> A.	upward	(14, -20)	$x = 14$
<input checked="" type="radio"/> B.	downward	(-20, 14)	$x = -20$
<input type="radio"/> C.	upward	(14, 20)	$x = 14$
<input type="radio"/> D.	downward	(20, 14)	$x = 20$

3. Which set of data is correct for the quadratic function:  $f(x) = -3(x + 2)(x - 3)$ ?

	x-intercepts	y-intercept	Axis of Symmetry
A.	(2, 0), (3, 0)	(0, -18)	$x = 2.5$
B.	(-2, 0), (3, 0)	(0, -18)	$x = -2.5$
C.	(2, 0), (-3, 0)	(0, 18)	$x = -0.5$
<b>D.</b>	(-2, 0), (3, 0)	(0, 18)	$x = 0.5$

$$\begin{aligned} x+2 &= 0 & x-3 &= 0 \\ x &= -2 & x &= 3 \end{aligned}$$

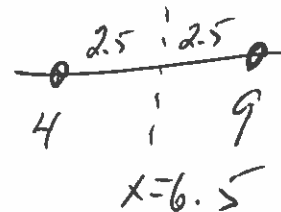
$$\begin{aligned} f(0) &= -3(0+2)(0-3) \\ &= -3(2)(-3) \\ &= 18 \end{aligned}$$



### NUMERIC RESPONSE 1

The x-intercepts of a quadratic function are (4,0) and (9,0). The equation for the axis of symmetry is written:  $x = h$ . The value of  $h$ , rounded to the nearest tenth is \_\_\_\_\_.

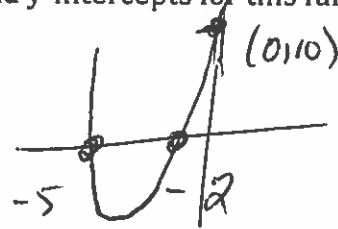
$$\frac{4+9}{2} = \frac{13}{2} = \cancel{6.5} \quad 6.5$$



Record your answer to one decimal place on the answer sheet.

4. Given:  $f(x) = x^2 + 7x + 10$ . What are the x- and y-intercepts for this function?

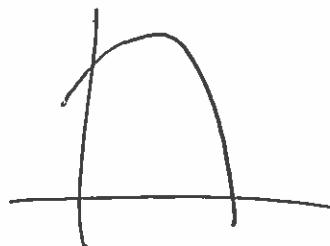
- A. (2,0) (5,0) and (0,-10)
- B. (2,0) (5,0) and (0,10)
- C. (-5,0) (-2,0) and (0,-10)
- D.** (-5,0) (-2,0) and (0,10)



5. Travis dives from a 6.0 m platform. He reaches a maximum height of 6.15 m after 0.20 s. How long does it take him to reach the water, if his height is given by the equation:

$$h(t) = -3.75(t - 0.20)^2 + 6.15 \quad ?$$

- A.** 1.48 s
- B. 1.08 s
- C. 1.44 s
- D. 1.04 s



"Zero"  
 $x = 1.48$

$$y = 0$$

**Written Response – Show all your work. You can use algebra or use a sketch to help justify as necessary.**

1. Use quadratic function skills to solve:

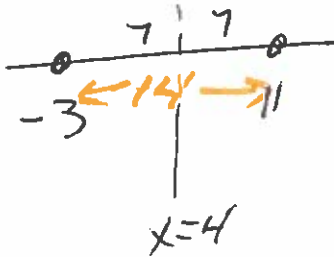
a) Does the quadratic function  $y = (x - 7)(x + 3)$  have x-intercepts of (7,0) and (3,0)? Explain or justify why you agree or disagree.

$$\begin{aligned} x-7=0 & & x+3=0 \\ x=7 & & x=-3 \end{aligned}$$

Disagree. The intercepts come from the factors equalling zero, then solving.

OR sketch graph

b) A quadratic function has x-intercepts of (-3,0) and (11,0). Explain or justify why the equation for the axis of symmetry is  $x = 4$ .



OR average  $\frac{-3+11}{2} = \frac{8}{2} = 4$   
 $x=4$

[8]

a) The quadratic function  $y = (x - 9)(x - 3)$  has an axis of symmetry  $x = 6$ . Determine the coordinates of the vertex for this function.

vertex  $f(6) = (6-9)(6-3)$

$$f(6) = (-3)(3)$$

$$f(6) = -9$$

vertex (6, -9)

b) The quadratic function  $y = -2(x + 3)^2 + 4$  has a vertex of (3,4) and a range of  $y \geq 4$ . Explain or justify why you agree or disagree.

vertex ... sym  $x+3=0$   
 $x=-3$

vertex (-3, 4)

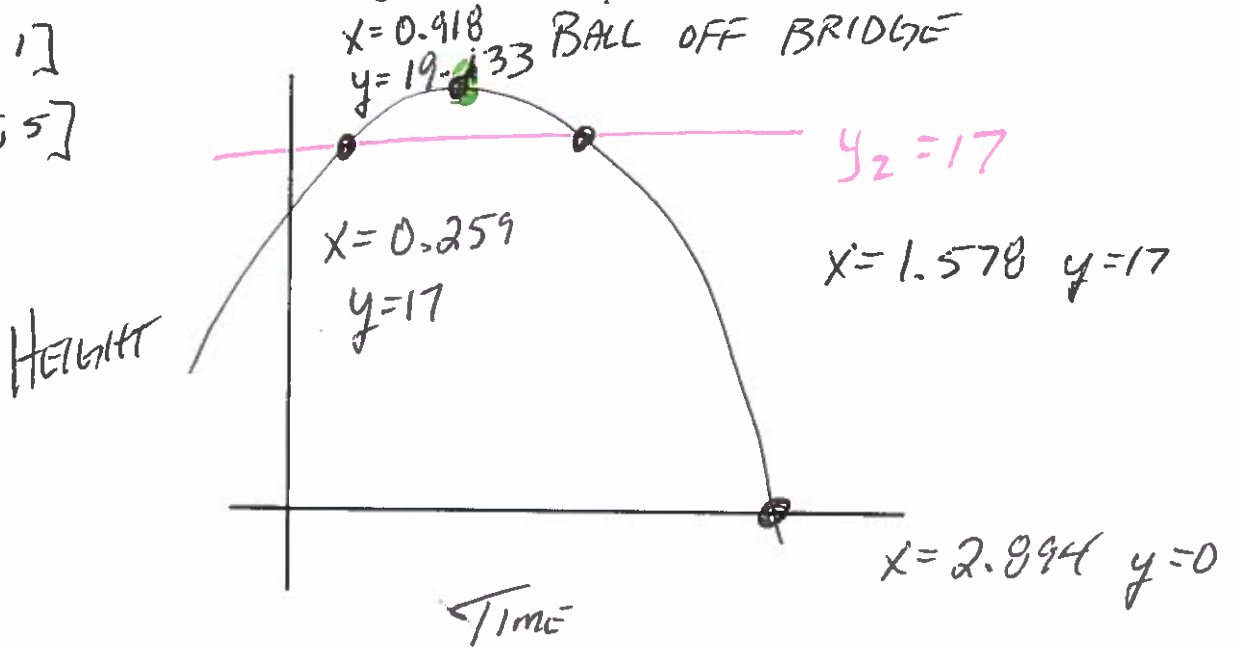
Function is negative, opens down. So there is a max y value of 4.

$$y \leq 4$$

2. A ball is thrown into the air from a bridge that is 15 m above a river. The function that models the height,  $h(t)$  in metres, of the ball over time,  $t$  in seconds, is  $h(t) = -4.9t^2 + 9.0t + 15$

a) Record your window setting and sketch the path of the ball.

X:  $[-1, 4, 1]$   
 Y:  $[-5, 25, 5]$



[5]

b) What TWO times is the ball 17 m above the water?

time of 0.3 s and 1.6 s.

$y_2 = 17$   
 "intersect"

c) When does the ball hit the water?

CALC - ZERO

time of 2.9 s.

d) How high does the ball go?

CALC - MAX

max height is 19.1 m