

### Unit 4 Quiz Review

1. Graph  $y = -x^2 + 4x + 6$ . Answer the following questions.

A. Vertex: (2, 10)  $x = \frac{-b}{2a} = \frac{-4}{-2} = 2$

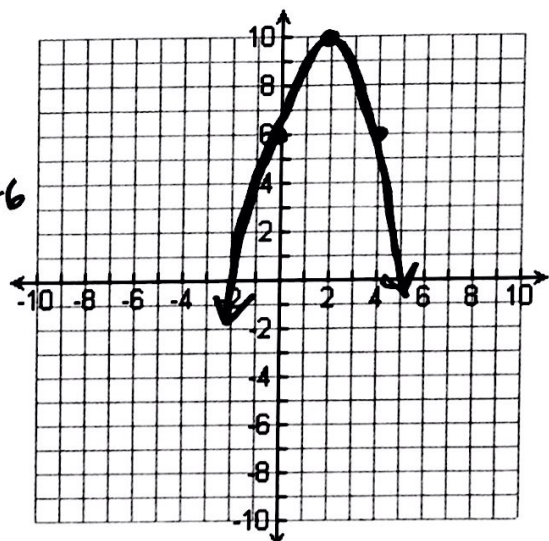
B. Axis of symmetry:  $x = 2$   $y = -(2)^2 + 4(2) + 6 = -4 + 8 + 6 = 10$

C. Min or Max Value:  $y = 10$

D. Domain:  $(-\infty, \infty)$

E. Range:  $y \leq 10$

x	y
0	6
4	6



2. The equation  $h = -16t^2 + 64t$  describes the height  $h$ , in feet, of a ball that is thrown straight up as a function of the time  $t$ , in seconds, that the ball has been in the air. At what time does the ball reach its maximum height? 2 sec. What is the maximum height? 64 ft.

$x = \frac{-64}{-32} = 2$   
 $h = -16(2)^2 + 64(2) = 64$

3. Describe how to transform the parent function  $y = x^2$  to the graph of  $y = \frac{1}{3}(x+2)^2 - 1$ .

left 2, down 1, wider

4. Write the equation  $y = 2x^2 - 12x - 3$  in vertex form.

$y = a(x-h)^2 + k$   
 $y = 2(x-3)^2 - 21$

$a = 2$   
 $b = -12$   
 $c = -3$

$x = \frac{-b}{2a} = \frac{12}{4} = 3$

$y = 2(3)^2 - 12(3) - 3 = -21$

5. Write the equations of a parabola that has a vertex at (4, 3) and contains the point (5, 2).

$y = a(x-4)^2 + 3$   
 $2 = a(5-4)^2 + 3$   
 $2 = a + 3$   
 $a = -1$

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

$y = -(x-4)(x-4) + 3$   
 $y = -(x^2 - 8x + 16) + 3$   
 $y = -x^2 + 8x - 16 + 3$   
 $y = -x^2 + 8x - 13$  (standard form)

Time (sec)	0	1	2	3
Height (ft)	46	63	48	1

Write the quadratic model for this data  $y = -16x^2 + 33x + 46$

What is the maximum height 63.02 ft.

When will the ball reach 60 feet  $x = .60, x = 1.47$

$x = \frac{-33}{-32} = 1.03$

$y = -16(1.03)^2 + 33(1.03) + 46$   
 $y = 63.02$

$60 = -16x^2 + 33x + 46$   
 $0 = -16x^2 + 33x - 14$  → find zeros on graph

7. Solve and Graph  $x^2 + 5x - 6 < 0$ .

$x = \frac{-b}{2a} = \frac{-5}{2} = -2.5$   
 $y = (-\frac{5}{2})^2 + 5(-\frac{5}{2}) - 6 = -12.25$



check (0,0) to figure out shading!

8. Graph  $y > x^2 - 4x - 6$

$x = \frac{4}{2} = 2$   
 $y = (2)^2 - 4(2) - 6 = -10$



x	y
0	-6
4	-6