

Name Key

HA2 Graphing Quadratic Functions Quiz Review

For each problem, find the answers then graph. Remember to label 5 points.

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

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

(h,k) Vertex: (-5, 3)

x's Domain: \mathbb{R}

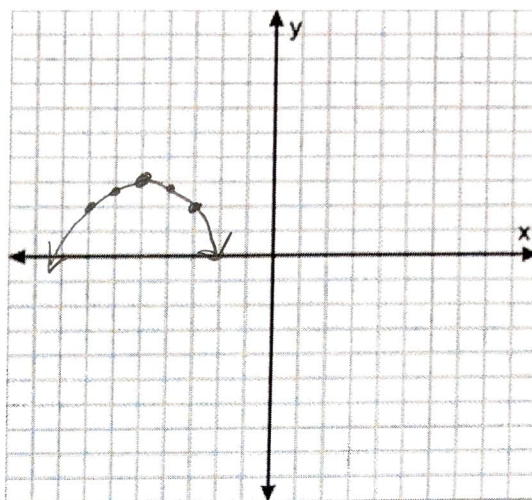
y's Range: $y \leq 3$

$x=h$ Axis of Symmetry: $x = -5$

Max/Min value: Max

x	y
-7	2
-6	2.75
-5	3
-4	2.75
-3	2

$-\frac{1}{4}(-7+5)^2 + 3$
 $-\frac{1}{4}(-6+5)^2 + 3$
 $-\frac{1}{4}(-4+5)^2 + 3$
 $-\frac{1}{4}(-3+5)^2 + 3$



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$$y = ax^2 + bx + c$$

($-\frac{b}{2a}$ substitute) 2. $y = -2x^2 - 4x + 3$

Vertex: (-1, 5)

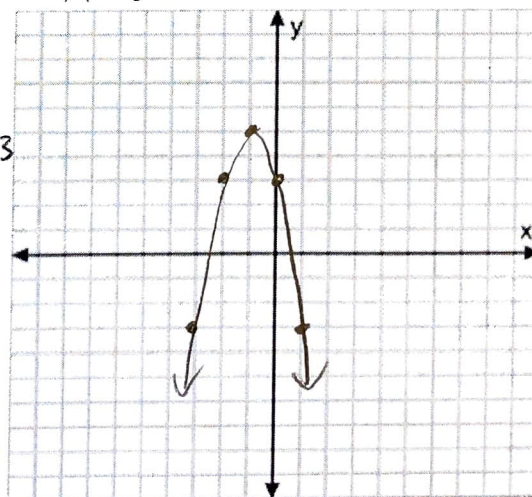
x's Domain: \mathbb{R}

y's Range: $y \leq 5$

$y = -2(-1)^2 - 4(-1) + 3 = 5$
 $x = -\frac{b}{2a}$ Axis of Symmetry: $x = \frac{-(-4)}{2(-2)} = \frac{4}{-4} = -1$ $x = -1$
 Max/Min value: Max

x	y
-3	-3
-2	3
-1	5
0	3
1	-3

$-2(-3)^2 - 4(-3) + 3$
 $-2(-2)^2 - 4(-3) + 3$
 $-2(0)^2 - 4(0) + 3$
 $-2(1)^2 - 4(1) + 3$



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$$0 = -4(x-1)(x+2)$$

$$x-1=0$$

$$x+2=0$$

$$\begin{array}{r} +1 \\ +1 \end{array}$$

$$\begin{array}{r} -2 \\ -2 \end{array}$$

$$x=1$$

$$x=-2$$

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

$$\text{Vertex: } (-0.5, 9)$$

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

$$\text{Axis of Symmetry: } x = \frac{-(4)}{2(4)} = \frac{-4}{8} = -\frac{1}{2} \quad x = -\frac{1}{2} = -0.5$$

Max/Min value: Max

x-intercepts: (0, 1) and (0, -2)

Domain: \mathbb{R}

Range: $y \leq 9$

x	y
-2.5	-7
-1.5	5
-0.5	9
0.5	5
1.5	-7

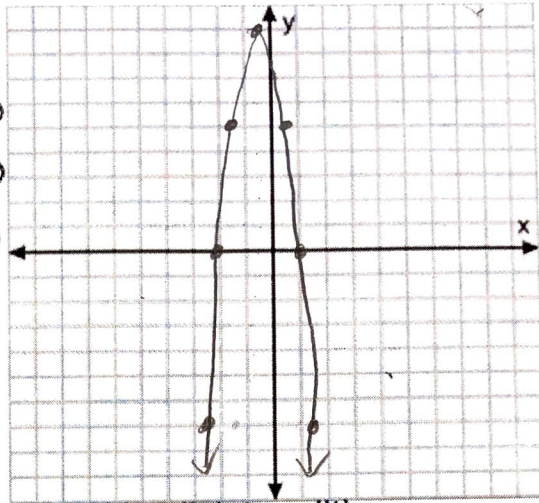
$$-4(-2.5-1)(-2.5+2)$$

$$-4(-1.5-1)(-1.5+2)$$

$$-4(-0.5-1)(-0.5+2)$$

$$-4(0.5-1)(0.5+2)$$

$$-4(1.5-1)(1.5+2)$$



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4. Write the equation of a parabola in vertex form given a vertex of (3, 1) and a point on the parabola of (1, -7).

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

h k

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

$$-7 = a(-2)^2 + 1$$

$$-7 = 4a + 1$$

$$\begin{array}{r} -1 \\ -8 = 4a \\ \frac{-8}{4} = \frac{4a}{4} \quad a = -2 \end{array}$$

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

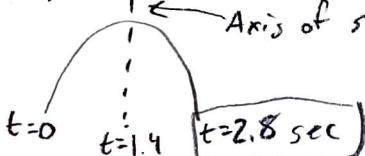
$$-7 = a(1-3)^2 + 1$$

5. A ball is thrown straight up from 3 m above the ground with a velocity of 14 m/s. The function modeling its height y with time t is $y = -5t^2 + 14t + 3$. For your answers, round to the nearest tenth, if necessary.

a) What is the maximum height of the ball?

$$t = \frac{-b}{2a} = \frac{-(14)}{2(-5)} = \frac{-14}{-10} = 1.4 \text{ sec} \quad h = -5(1.4)^2 + 14(1.4) + 3 = 12.8 \text{ m}$$

b) How far from where it was thrown does the ball hit the ground?



6. Solve by factoring:

$$3x^2 + 13x + 7 = -5$$

$$3x^2 + 13x + 12 = 0$$

$$(3x+4)(x+3) = 0$$

$$\begin{array}{r} 4x \\ + 9x \\ \hline 13x \end{array}$$

$$3x+4=0$$

$$3x = -4$$

$$x = -\frac{4}{3}$$

$$x+3=0$$

$$x = -3$$