

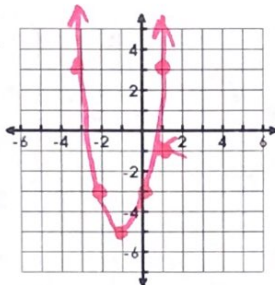
Name: _____ Date: _____

Unit 5 Review

Graph the following equation. Then, write the characteristics for the graph.

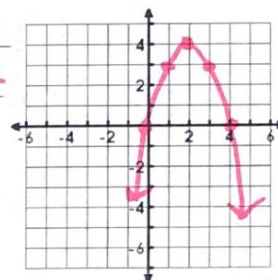
1. $y = 2(x+1)^2 - 5$

- Vertex: $(-1, -5)$
- Axis of Sym.: $x = -1$
- Solutions: $(-2.5, 0)$
 $(0.5, 0)$
- Y-intercept: $(0, -3)$

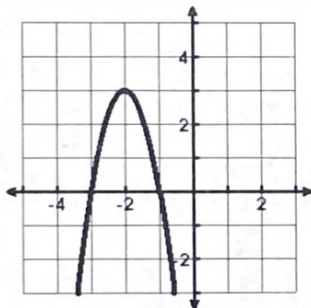


2. $y = -x^2 + 4x$

- Vertex: $(2, 4)$
- Axis of Sym.: $x = 2$
- Zeros: $x = 0, 4$
- Y-Intercept: $(0, 0)$



3.



• Describe the transformations:

- Reflect over x-axis
- Vertical stretch by 3
- Left 2
- Up 3

• Write the equation in vertex form: $y = -3(x+2)^2 + 3$

• Roots: $x = -1, -3$

Describe the transformations to the parent function in the given equations.

Function	a	h	k
4. $-f(x+2) - 5$	$a = -1$ Reflect over x-axis	$h = -2$ Left 2	$k = -5$ down 5
5. $3f(x-4) + 2$	$a = 3$ vertical stretch by 3	$h = 4$ Right 4	$k = 2$ up 2
6. $\frac{1}{2}f(x) - 1$	$a = \frac{1}{2}$ vertical shrink	$h = 0$ No change	$k = -1$ down 1
7. $-f(x-2)$	$a = -1$ Reflect over x-axis	$h = 2$ Right 2	$k = 0$ No change

Solve using any method.

8. $x^2 - 14x = -10$

$$\sqrt{(x-7)^2} = \sqrt{39}$$

$$x-7 = \pm\sqrt{39}$$

$$x = 7 \pm \sqrt{39}$$

Change the equations to standard form.

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

$$2(x^2 - 2x + 1) + 4$$

$$2x^2 - 4x + 2 + 4$$

$$f(x) = 2x^2 - 4x + 6$$

10. $y = -(x+4)^2 - 6$

$$f(x) = -(x^2 + 8x + 16) - 6$$

$$f(x) = -x^2 - 8x - 16 - 6$$

$$f(x) = -x^2 - 8x - 22$$

Change the equations to vertex form.

11. $y = -3x^2 + 6x - 2$

$$a = -3 \quad b = 6 \quad c = -2$$

$$h = \frac{-b}{2a} = 1$$

$$k = 1$$

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

12. $y = 2x^2 + 8x + 1$

$$a = 2 \quad b = 8 \quad c = 1$$

$$h = -2$$

$$k = -7$$

$$y = 2(x+2)^2 - 7$$

An object is projected into the air with a path described by the function $h(t) = -16t^2 + 96t + 160$ where h is the height above the ground in feet and t is the time in seconds since the object started along the path.

13. Find the time the object changes direction. (vertex)

$$(h) \quad x = 3 \text{ sec}$$

14. Find the maximum height of the object. (vertex)

$$(k) \quad y = 304 \text{ ft}$$

15. Describe the location of the object at 2.5 seconds.

$$h(2.5) = -16(2.5)^2 + 96(2.5) + 160 = 300 \text{ ft}$$

The height, in meters, of a ball as it falls at a given time (x), in seconds, can be found using the equation $f(x) = -4x^2 + 36$.

16. At what height does the ball start?

$$f(0) = -4(0)^2 + 36 = 36 \text{ m}$$

17. When does the ball hit the ground?

$$-4x^2 + 36 = 0$$

$$-4x^2 = -36$$

$$\sqrt{x^2} = \sqrt{9}$$

$$x = 3, \cancel{-3}$$

$$3 \text{ seconds}$$