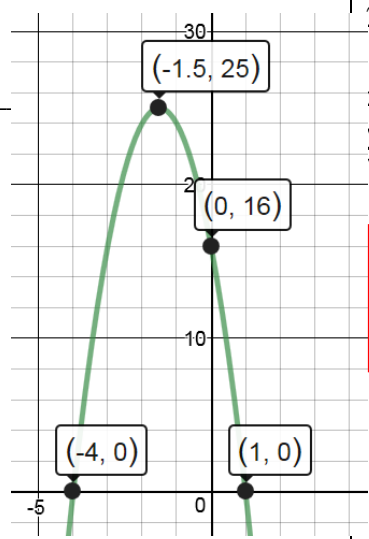


Graph each function. Be sure it goes through the vertex, x-intercepts, and y-intercept.

1.  $f(x) = -4x^2 - 12x + 16$

x- intercepts: \_\_\_\_\_, \_\_\_\_\_  
 y-intercept: \_\_\_\_\_  
 Vertex: \_\_\_\_\_

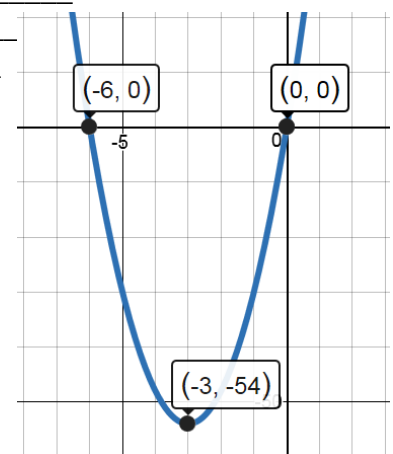
$x: (-4, 0), (1, 0)$   
 $y: (0, 16)$   
 vertex:  $(-1.5, 25)$



2.  $f(x) = 6x^2 + 36x$

x- intercepts: \_\_\_\_\_, \_\_\_\_\_  
 y-intercept: \_\_\_\_\_  
 Vertex: \_\_\_\_\_

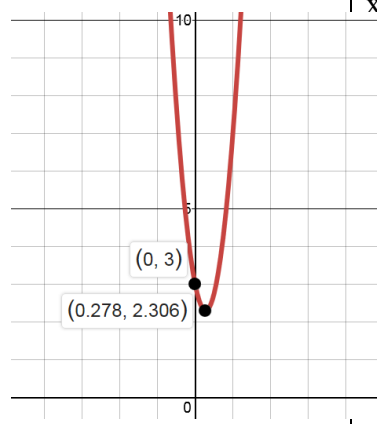
$x: (-6, 0), (0, 0)$   
 $y: (0, 0)$   
 vertex:  $(-3, -54)$



3.  $f(x) = 9x^2 - 5x + 3$

x- intercepts: \_\_\_\_\_, \_\_\_\_\_  
 y-intercept: \_\_\_\_\_  
 Vertex: \_\_\_\_\_

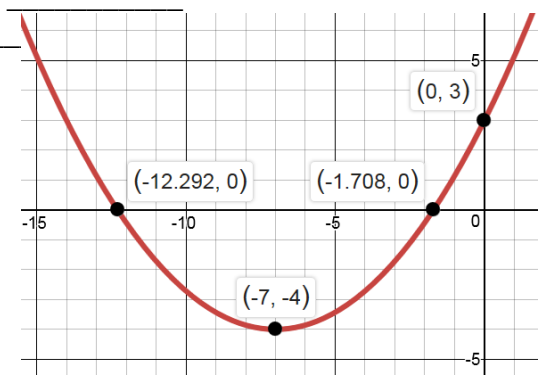
$x: \text{none}$   
 $y: (0, 3)$   
 vertex:  $(0.278, 2.306)$



4.  $f(x) = \frac{1}{7}x^2 + 2x + 3$

x- intercepts: \_\_\_\_\_, \_\_\_\_\_  
 y-intercept: \_\_\_\_\_  
 Vertex: \_\_\_\_\_

$x: (-12.3, 0), (-1.7, 0)$   
 $y: (0, 3)$   
 vertex:  $(-7, -4)$



Write the equation of the parabola in standard form and then identify the vertex.

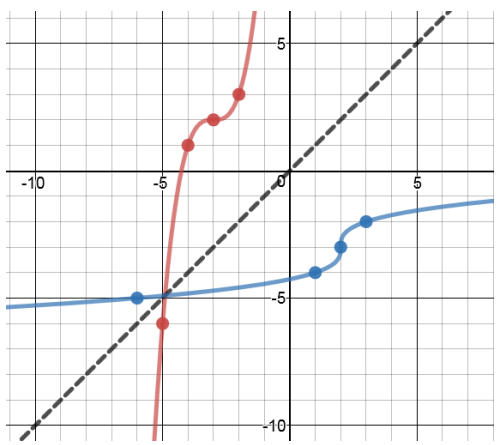
5.  $f(x) = 3x^2 - 18x + 12$

$f(x) = 3(x - 3)^2 - 15$   
 vertex:  $(3, -15)$

6.  $f(x) = 4x^2 + 8x - 5$

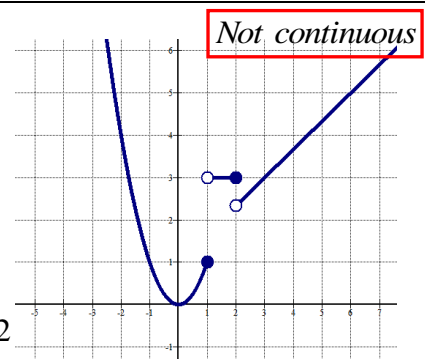
$f(x) = 4(x + 1)^2 - 9$   
 vertex:  $(-1, -9)$

7. Given the graph of  $f(x)$ , graph the inverse function  $f^{-1}(x)$ .

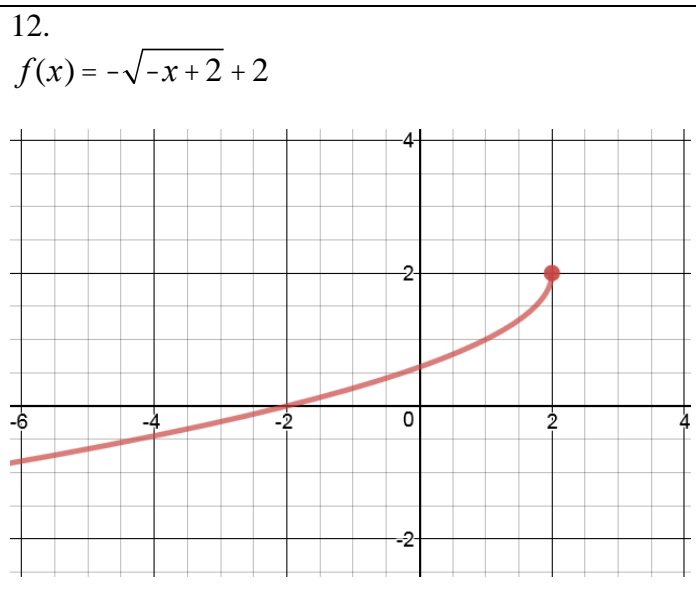
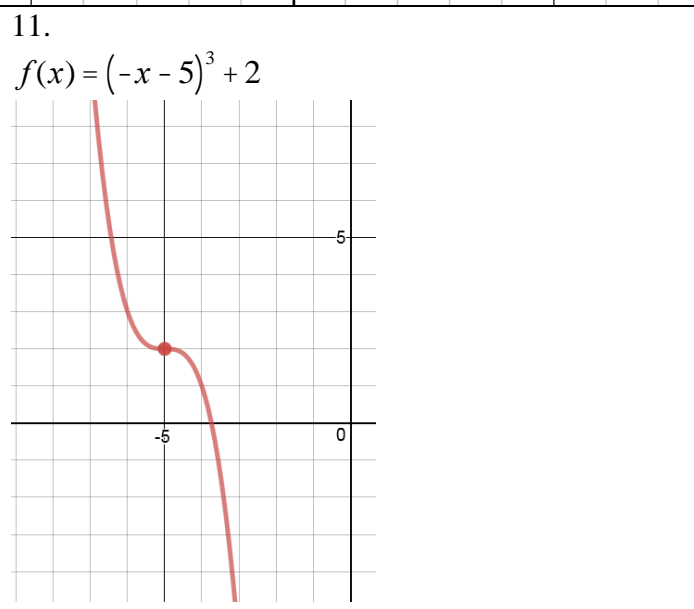
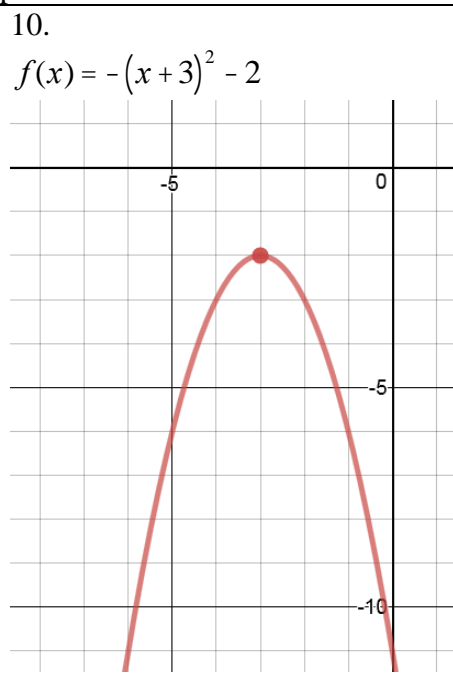
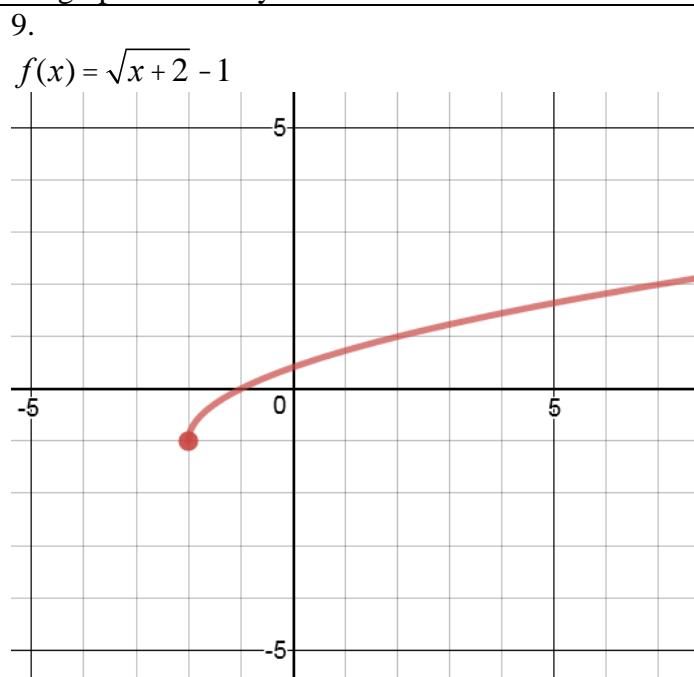


8.

$$f(x) = \begin{cases} x^2 & x \leq 1 \\ 3 & 1 < x \leq 2 \\ \frac{2}{3}x + 1 & x > 2 \end{cases}$$



Graph Each Function. Be sure there are whole number points clearly marked that show the overall shape of the graph. State any shifts or reflections relative to the parent function.



Find the inverse of each function

13.  $f(x) = 6 - 2x$       $f^{-1}(x) = \frac{6-x}{2}$

14.  $f(x) = \sqrt{x-5}$       $f^{-1}(x) = x^2 + 5$

15.  $f(x) = \frac{3x-4}{x+7}$       $f^{-1}(x) = \frac{7x+4}{3-x}$

16.  $f(x) = x^2 - 3$       $f^{-1}(x) = \sqrt{x-3}$

Determine if the functions are inverses.

17.  $f(x) = 4x + 5$       $g(x) = \frac{x-5}{4}$      **Yes**

18.  $f(x) = \frac{4-x}{2}$       $g(x) = 8 + 2x$      **No**

How can you determine if a function is a one-to-one function?

*It passes the horizontal line test*

19. Use the functions  $f(x)$  and  $g(x)$  to answer the following questions

$f(x)$

$g(x)$

a)  $f(3) = 1$

b)  $g(-4) = -3$

c)  $(f + g)(2) = 2$

d)  $(f - g)(-4) = 6$

e)  $(fg)(-2) = 1$

f)  $(f/g)(-3) = -\frac{1}{2}$

g)  $(f \circ g)(3) = -1$

h)  $(g \circ f)(1) = -2$

i)  $(f \circ g)(-2) = -3$

j)  $(g \circ g)(4) = 2$

k)  $(g \circ f)(-5) = 0$

l)  $(f \circ f)(0) = 5$

20. A rock thrown off the San Francisco bridge at a velocity of 24 ft/s followed the given path:

$$h(t) = -16t^2 + 24t + 526$$

A. How long did it take the rock to hit the water?

**6.5 seconds**

B. How tall was the bridge? **526 feet**

21. Other stuff you should review:

These answers should be on my desk.

Given the two functions  $f(x) = x^2 - 3x + 5$  and  $g(x) = 4x + 3$  determine each:

22.  $(f \circ g)(x) = 16x^2 + 12x + 5$

23.  $(g \circ g)(x) = 16x + 15$

24.  $(g \circ f)(2) = 4x^2 - 12x + 23$

25.  $(f \circ g)(-3) = 113$

Determine two functions  $f(x)$  and  $g(x)$  such that  $h(x) = f(g(x))$ .

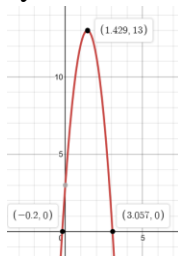
26.  $h(x) = \sqrt{2x}$   
 $f(x) = \sqrt{x}$   
 $g(x) = 2x$

27.  $h(x) = 4\left(\frac{1}{2x}\right)^2 + 8\left(\frac{1}{2x}\right) - 5$   
 $f(x) = 4x^2 + 8x - 5$   
 $g(x) = \frac{1}{2x}$

28. A ball thrown straight up, from 3 meters above the ground, with a velocity of 14 m/s has a path that follows the equation:

$$h(t) = -4.9t^2 + 14t + 3$$

A. Sketch the graph



B. When does the ball hit the ground?

**3.057 seconds**

C. What is the maximum height? **13 feet**

29.

$$f(x) = \begin{cases} x + 2 & x \leq -1 \\ 1 & -1 < x \leq 1 \\ 2x - 1 & x > 1 \end{cases}$$

**Continuous**

