10.3 Quadratics in Standard Form

PRACTICE

Directions: Use the following functions to find the best answers for #1 – 3.

$f(x) = 4x^2 - 8x + 10$; $g(x) = 2(x+4)^2 - 1$; $h(x) = (x+4)(x+2)$

1) Which function has the lowest minimum value?

a) f(x)
b) g(x)
c) h(x)
d) g(x) and h(x)

2) Which function has the lowest y-intercept?

a) f(x)
b) g(x)
c) h(x)
d) f(x) and h(x)

3) Which function is the widest?

a) f(x) because the leading coefficient is the greatest.
b) g(x) because its in vertex form.
c) h(x) because its leading coefficient is the smallest.
d) They are all the same because they are all quadratics.

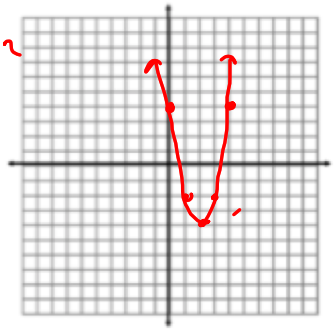
Directions: Graph each function. Then answer the questions. Plot the vertex and at least 2 other points, more if possible.

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

Vertex:

Y-int:

X-ints (approx.):

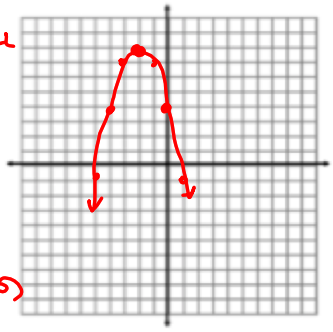


5) $f(x) = -x^2 - 4x + 4$

Vertex:

Y-int:

X-ints (approx.):

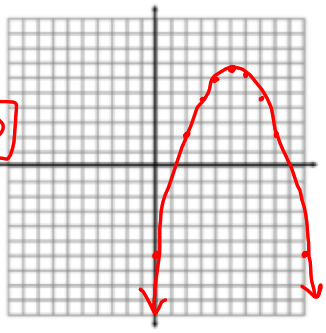


6) $f(x) = -0.5x^2 + 5x - 6$

Vertex:

Y-int:

X-ints (approx.):

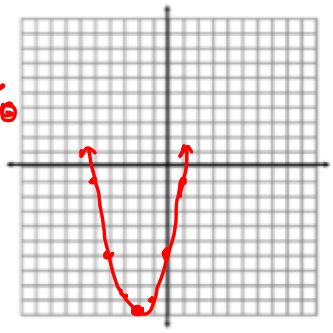


7) $f(x) = x^2 + 4x - 6$

Vertex:

Y-int:

X-ints (approx.):

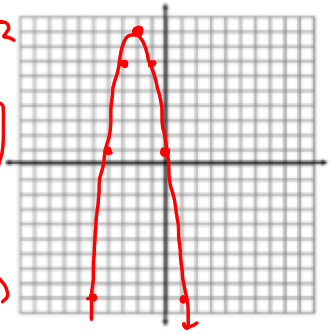


8) $f(x) = -2x^2 - 8x + 1$

Vertex:

Y-int:

X-ints (approx.):



9) $f(x) = -0.5x^2 - 6x - 8$

Vertex:

Y-int:

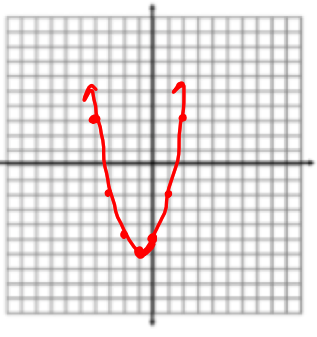
X-ints (approx.):

10) $f(x) = x^2 + 2x - 5$

Vertex:

Y-int:

X-ints (approx.):

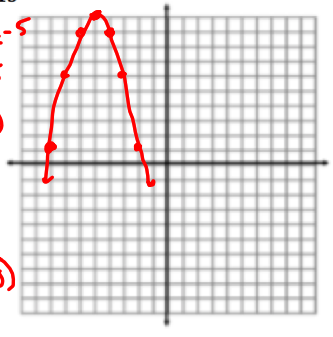


11) $f(x) = -x^2 - 10x - 15$

Vertex:

Y-int:

X-ints (approx.):



Directions 12-13: Solve each system.

12) $\begin{cases} 6x - 8y = -4 \\ 4x + 2y = -10 \end{cases}$

$16x + 8y = -40$

$6x - 8y = -4$

$\frac{22x}{22} = \frac{-44}{22}$

$x = -2$

$4(-2) + 2y = -10$

$-8 + 2y = -10$

$+8 \quad +8$

$\frac{2y}{2} = \frac{-2}{2}$

$y = -1$

$(-2, -1)$

13) $\begin{cases} 2x + 8y = -16 \\ y = x - 12 \end{cases}$

$2x + 8(x-12) = -16$

$2x + 8x - 96 = -16$

$10x - 96 = -16$

$+96 \quad +96$

$\frac{10x}{10} = \frac{80}{10}$

$x = 8$

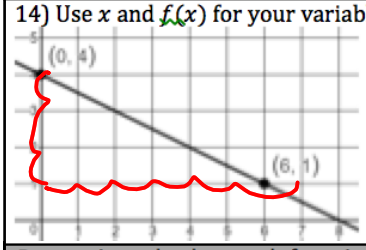
$y = 8 - 12$

$y = -4$

$(8, -4)$

Identify the type of relationship and create a function from the given information.

14) Use x and $f(x)$ for your variables.



$y = mx + b$

$y = \frac{-3}{6}x + 4$

$y = -\frac{1}{2}x + 4$

15) There are 100 rodents in a barn. Every month m, the rodent population p increases by 200%.

$100 + 200 = 300$

$300 \cdot 3 = 900$

$y = a \cdot b^x$

$y = 100(3)^x$

Determine whether each function has a maximum or minimum point and then find the vaule.

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

MINIMUM VALUE @ $(-3, -32)$

$x = \frac{-b}{2a} = \frac{-18}{2(3)} = \frac{-18}{6} = -3$

$y = 3(-3)^2 + 18(-3) - 5$

$= -32$

17) $f(x) = -10x^2 - 200x + 100$

MAXIMUM VALUE @ $(-10, 1100)$

$x = \frac{-b}{2a} = \frac{200}{-20} = -10$

$y = -10(-10)^2 - 200(-10) + 100$

$y = 1100$

18) $f(x) = -0.75x^2 + 33x - 5.5$

MAX VALUE @ $(22, 357.5)$

$x = \frac{-33}{2(-.75)} = 22$

$y = -.75(22)^2 + 33(22) - 5.5$

$= 357.5$

19) $f(x) = 4000x^2 - 5$

MIN VALUE @ $(0, -5)$

$x = \frac{-0}{2(4000)} = 0$

$y = 4000(0)^2 - 5$

$= -5$