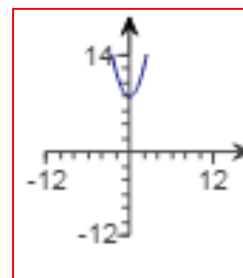# QUIZ 5 EXAMPLES

Which graph shown below is the graph of the following function?

$f(x) = x^2 + 8$         <span style="color:orange">Up 8 units</span>



Determine whether the given function is linear or nonlinear. If it is linear, determine the slope.

| x | y = f(x) |
|---|---|
| 1 | - 26 |
| 2 | - 4 |
| 3 | 2 |
| 4 | - 1 |
| 5 | 10 |

Is the function a linear function?

<span style="color:orange">Check slope on two set of points</span>

○ Yes         <span style="color:orange">Here, they do not equal</span>

◉ No

Select the correct choice below and fill in any answer boxes within your choice.

○ A. The slope of the function is ☐.

◉ B. The function is not linear.

Graph the function $f(x) = 2x^2 - 8x + 5$ by starting with the graph of $y = x^2$ and using transformations (shifting, stretching/compressing, and/or reflecting).
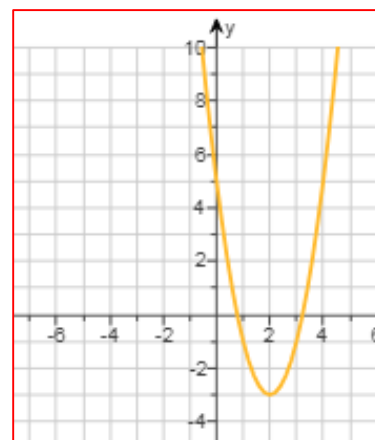
$$x = \frac{-b}{2a} \rightarrow \frac{8}{4} = 2$$

$y = 2(2)^2 - 8(2) + 5 \quad = -3$

<span style="color:blue">VERTEX is (2,-3)</span>

*Use vertical {down 3}

     horizontal {right 2} on graphing tool

*Vertical stretch of 2

In parts (a)-(f), use the given figure.  **f(x) = y value**

(a) Solve $f(x) = 6$.  *Find x where y = 6*    **x= 6**
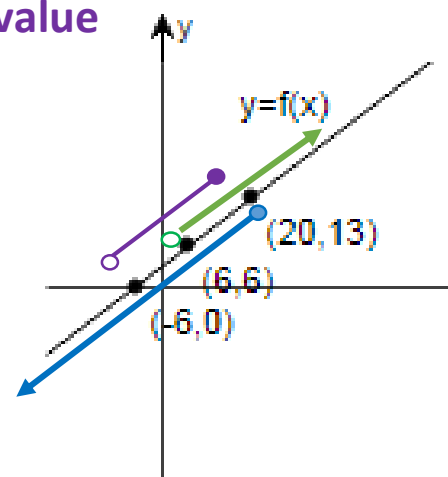
(b) Solve $f(x) = 13$.  *Find x where y = 13*   **x= 20**

(c) Solve $f(x) = 0$.  *Find x where y = 0*    **x= -6**

(d) Solve $f(x) > 6$.  *Find x where y > 6*    **(6,∞)**

(e) Solve $f(x) \le 13$.  *Find x where y ≤13*  **(∞,20]**

(f) Solve $0 < f(x) < 13$.  *Find x where 0< y ≤ 13*   **(-6,20]**



y=f(x)

(20,13)

(6,6)

(-6,0)

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Determine, without graphing, whether the given quadratic function has a maximum value or a minimum value and then find the value.

$$f(x) = 3x^2 + 30x - 5$$

Does the quadratic function f have a minimum value or a maximum value?

◉ The function f has a minimum value.

○ The function f has a maximum value.    **Opens up so it has a minimum and the vertex is (-5,-80)**

What is this minimum or maximum value?

$-80$    **Minimum value is the y value in the vertex**

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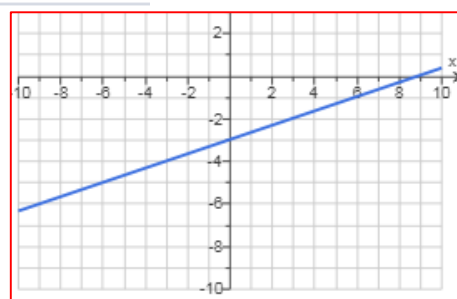A linear function is given. Complete parts (a)-(d).

$$h(x) = \frac{1}{3}x - 3$$

(a) Determine the slope and y-intercept of the function.

The slope is $\dfrac{1}{3}$.

(Type an integer or a simplified fraction.)

The y-intercept is $-3$.

(Type an integer or a simplified fraction.)



(b) Use the slope and y-intercept to graph the linear function.

Use the graphing tool to graph the function. Use the slope and y-intercept when drawing the line.

(c) Determine the average rate of change of the function.

The average rate of change is $\dfrac{1}{3}$.    **THE SLOPE**

(Type an integer or a fraction.)

(d) Determine whether the linear function is increasing, decreasing, or constant. Choose the correct answer below.

◉ A.  increasing

Suppose that a company has just purchased a new computer for $2100. The company chooses to depreciate using the straight-line method for 7 years.

(a) Write a linear function that expresses the book value of the computer as a function of its age.

**Divide to get slope**

$V(x) = \boxed{2100 - 300x}$

(Type your answer in slope-intercept form.)

(b) What is the implied domain of the function found in part (a)?

$\boxed{[0,7]}$  **RANGE OF X VALUES**

(Type your answer in interval notation.)

(c) Use the graphing tool to graph the linear equation.

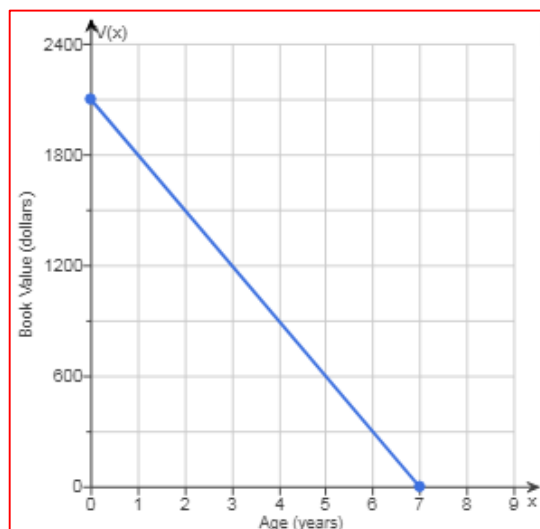(d) What is the book value of the computer after 4 years?

**Use graph**

$\boxed{900}$

(Round to the nearest dollar as needed.)

(e) When will the computer be worth $1800?

After $\boxed{1}$ year(s) the computer will be worth $1800.



Give the slope and the y-intercept of the line with the given equation.  Then, graph the linear equation.

$y = 2x + 4$

What is the slope? Select the correct choice below and fill in any answer boxes within your choice.
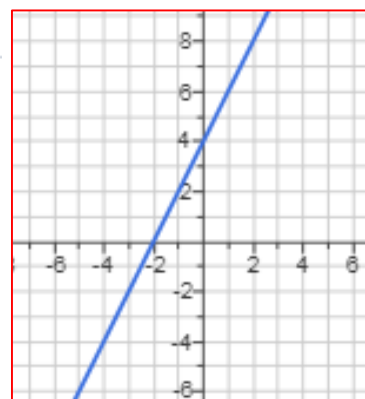
A. The slope is $\boxed{2}$.
   (Simplify your answer.)

B. The slope is undefined.

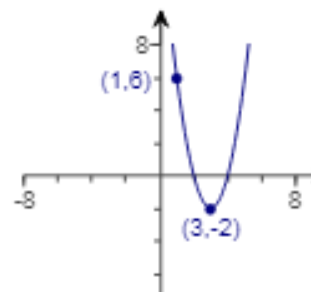What is the y-intercept? Select the correct choice below and fill in any answer boxes within your choice.

A. The y-intercept is $\boxed{4}$.
   (Type an integer or a simplified fraction.)

B. There is no y-intercept.

Determine the quadratic function f whose graph is given.

The vertex is (3, − 2) and the other given point is (1,6).


(1,6)
(3,-2)

$y = a(x-h)^2 + k$ **where vertex is (h,k)**

$6 = a(1-3)^2 - 2 \rightarrow 6 = 4a - 2 \rightarrow 8 = 4a$

**a = 2**          then

$y = 2(x-3)^2 - 2$  then foil, distribute and simplify

$2(x^2 - 6x + 9) - 2$
$y = 2x^2 - 12x + 16$

Suppose that the manufacturer of a gas clothes dryer has found that, when the unit price is p dollars, the revenue R (in dollars) is

$R(p) = -3p^2 + 24,000p$

What unit price should be established for the dryer to maximize revenue?  What is the maximum revenue?

The unit price that should be established to maximize revenue is $ 4000 .     Vertex (400, 48000000)
(Simplify your answer.)
The maximum revenue is $ 48000000 .

**First value is x and second value is y of the vertex**

The marginal cost of a product can be thought of as the cost of producing one additional unit of output.  For example, if the marginal cost of producing the 50th product is $6.20, it cost $6.20 to increase production from 49 to 50 units of output. Suppose the marginal cost C (in dollars) to produce x thousand mp3 players is given by the function
$C(x) = x^2 - 120x + 8300$.

A.  How many players should be produced to minimize the marginal cost?
B.  What is the minimum marginal cost?

**Find VERTEX, part A is x value which is 60**

**Part B is y value which is $4700**

Determine, without graphing, whether the given quadratic function has a maximum value or a minimum value and then find the value.

$f(x) = -2x^2 + 20x - 7$

Does the quadratic function f have a minimum value or a maximum value?

○   The function f has a minimum value.   Opens down so it has a maximum
☑   The function f has a maximum value.
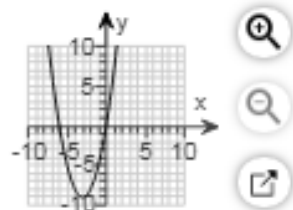
                                          The y value of the vertex is the max which is **43**
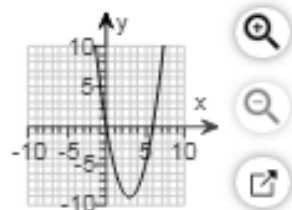
What is this minimum or maximum value?

Match the function $f(x) = x^2 - 6x$ to one of the given graphs.

Choose the correct graph below.  We look at the x-intercepts by factoring x(x-6)=0   x=0,6

○ A.



✔ B.



○ C.