

# Quadratic Equations Quiz Review

Name: Key Period: \_\_\_\_\_

Directions: Show your work to receive full credit.

Standard Form of a Quadratic Equation:  $f(x) = ax^2 + bx + c$

- $c$  is always the y-intercept of the graph.
- The  $x$ -intercepts are the zeros or roots to the equation.
- The graph of a quadratic equation is a parabola.

1) Which is the factored form of  $f(x) = 7x^2 + 5x - 2$ ?

~~$\begin{array}{r} -14 \\ 7 \quad -2 \\ \hline 5 \end{array}$~~   $(7x^2 + 7x - 2x - 2)$   
 $7x(x+1) - 2(x+1)$

- (A)  $f(x) = (7x - 2)(x + 1)$       B)  $f(x) = (7x + 1)(x - 2)$        $(7x - 2)(x + 1)$   
 C)  $f(x) = (5x - 1)(2x + 2)$       D)  $f(x) = (4x + 2)(3x - 4)$

2) Solve the equation by factoring:  $f(x) = x^2 + 3x - 4$ , then graph the equation by plotting the intercepts.

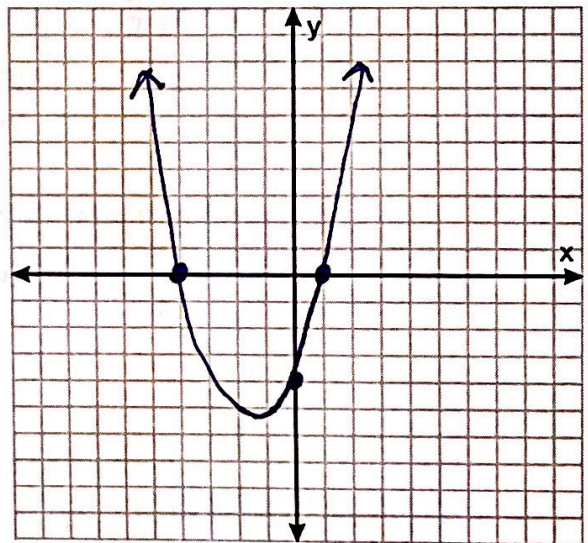
$\therefore (x+4)(x-1) = 0$

$x+4=0$        $x-1=0$

$x = -4$        $x = 1$

y-intercept: -4

~~$\begin{array}{r} -4 \\ 4 \quad -1 \\ \hline 3 \end{array}$~~



3) Solve the equation using factoring:  $3x^2 - 8x - 3 = 0$

$(3x^2 - 9x + x - 3) = 0$        $3x + 1 = 0$

$3x(x-3) + 1(x-3) = 0$        $3x = -1$   
 $(3x+1)(x-3) = 0$        $x = -\frac{1}{3}$

~~$\begin{array}{r} -9 \\ -9 \quad 1 \\ \hline -8 \end{array}$~~

$x-3=0$   
 $x=3$

5) Identify the y-intercept of the equation  $f(x) = -2x^2 + 5x - 8$ . ← always  $c$

- A) 3      B) -3      C) -8      D) 0

6) Select ALL the solutions to the following equation:  $2x^2 + 3x - 9 = 0$

$(2x^2 + 6x - 3x - 9) = 0$

$2x(x+3) - 3(x+3) = 0$

$(2x-3)(x+3) = 0$

$2x-3=0$        $x+3=0$

$2x=3$        $x=-3$   
 $x=3/2$

~~$\begin{array}{r} -18 \\ 6 \quad -3 \\ \hline 3 \end{array}$~~

- A)  $x = 3$       B)  $x = -3$       C)  $x = -\frac{2}{3}$       D)  $x = \frac{3}{2}$

**Vertex Form of a Quadratic Equation:  $f(x) = a(x - h)^2 + k$**

Vertex form shows the transformations on a quadratic in relation to its parent  $f(x) = x^2$ .

- $(h, k)$  is the vertex (change  $h$ , keep  $k$ ).
- $a$  determines the width and direction of the parabola.
  - $|a| > 1$  stretches the graph (makes it skinnier).
  - $|a| < 1$  shrinks the graph (makes it wider).
  - $-a$  reflects the graph over the  $x$ -axis.
- $h$  determines the horizontal shift ( $+h$  moves the graph left,  $-h$  moves the graph right).
- $k$  determines the vertical shift ( $+k$  moves the graph up,  $-k$  moves the graph down).
- To find the  $y$ -intercept of the graph, plug in 0 for  $x$  and simplify the expression.

6) Identify all the transformations for  $f(x) = \frac{1}{2}(x - 3)^2 + 8$ .

Shrunk by factor of  $\frac{1}{2}$ , right 3, up 8

7) Find the  $y$ -intercept for the function  $f(x) = 3(x + 2)^2 - 7$ .

A) (0,3)

B) (0,2)

**C) (0,5)**

D) (0, -7)

$$\begin{aligned} &3(0+2)^2 - 7 \\ &3(2)^2 - 7 \\ &3(4) - 7 \\ &12 - 7 = 5 \end{aligned}$$

8) Write the vertex form of the quadratic function that has the following transformations:

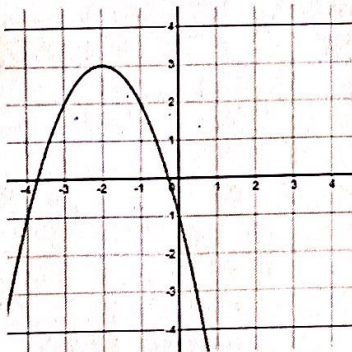
- Shifted 5 units down  $-k$
- Shifted 4 units left  $+h$
- Reflected over the  $x$ -axis  $-a$
- Stretched by a factor of  $3|a|$

$$f(x) = -3(x + 4)^2 - 5$$

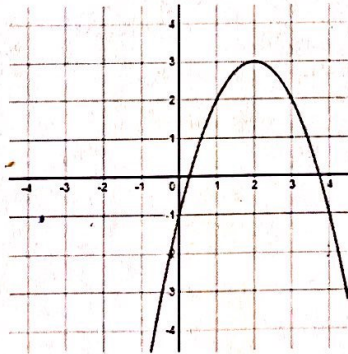
9) Which graph represents the equation  $f(x) = -(x - 2)^2 + 3$ ?

vertex: (2, 3)  
reflect

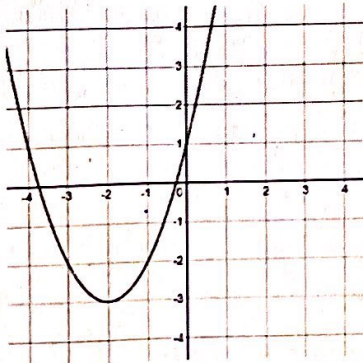
a.)



**b.)**



c.)



d.)

