

B #2  
B

1. What is the equation of the axis of symmetry of the graph of  $y = x^2 + 6x - 7$ ?

a.  $x = 6$

$ax^2 + bx + c$

c.  $x = 3$

$x^2 = |x^2$

b.  $x = -3$

$y = x^2 + 6x - 7$

d.  $x = -6$

$a = 1$   $b = 6$

axis of  
symmetry

$$x = \frac{-b}{2a} = \frac{-6}{2(1)} = -3$$

$x = -3$

B#1  
C

2. Find the coordinates of the vertex of the graph of  $y = 3x^2 - 6$ . Identify the vertex as a maximum or a minimum.

a.  $(0, -6)$ ; maximum

b.  $(-6, 0)$ ; minimum

c.  $(0, -6)$ ; minimum

d.  $(6, 0)$ ; minimum

$y = ax^2 + bx + c$   
 $y = 3x^2 - 6$   
 $a = 3$   
 $b = 0$   
 $c = -6$

$(0, -6)$   
min b/c  $a$  is positive


Vertex  $(-\frac{b}{2a}, \dots)$   
axis of symmetry

$x^2 + 3$   
 $c = 1, b = 0$   
 $a = 3$   
 $x^2 + 3x$   
 $a = 1, b = 3$   
 $c = 0$   
find  $y$  when  $x = -\frac{b}{2a}$

$-\frac{b}{2a} = \frac{0}{2(3)} = 0$

$y = 3(0)^2 - 6$   
 $y = -6$

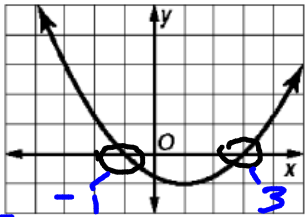
When  $x = 0$   $y = c$

  $x$  pos.  
minimum

 maximum  
 $x$  neg

B#5  
D

3. What are the roots of the quadratic equation whose related function is graphed below?



roots = where function  
crosses x-axis

- a. -1, 3   b. -1, 1   c. -3, 1   d. 1, 3

B#9  
D

4. Solve  $k^2 + 4k + 4 = 25$  by taking the square root of each side.

- a.  $-5, 5$   
b.  $5$

- c.  $-3, 7$   
d.  $-7, 3$

$$k^2 + 4k + 4 = 25$$

$$\sqrt{(k+2)^2} = \sqrt{25}$$

$$k+2 = \pm 5$$

$$\begin{array}{r} -2 \quad -2 \\ \hline \end{array}$$

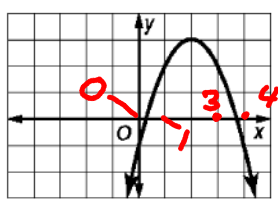
$$k = -2 \pm 5$$

$$-2 + 5 = 3$$

$$-2 - 5 = -7$$

\_\_\_\_\_ 5. One root of the quadratic equation whose related function is graphed lies between which consecutive integers?

B#8  
A



- a. 1 and 2   b. 2 and 3   c. 0 and -1   d. 0 and 1

B#3

6. Which equation is equivalent to  $3x^2 + 24x + 15 = 0$ ?

(a)

a.  $(x + 4)^2 = 11$

b.  $(x + 4)^2 = 1$

$\frac{3x^2}{3} + \frac{24x}{3} + \frac{15}{3} = \frac{0}{3}$  c.  $(x + 2)^2 = -1$   
d.  $(x + 2)^2 = -11$

① clear space

②  $c = \left(\frac{b}{2a}\right)^2$   
both sides

$\left(\frac{8}{2}\right)^2 = 16$

③ change to factored form

$x^2 + 8x + 5 = 0$   
-5 -5

$x^2 + 8x + 16 = -5 + 16$

$(x + 4)^2 = 11$

$\frac{b}{2}$

7. Find the coordinates of the vertex of the graph of  $y = 4 - x^2$ . Identify the vertex as a maximum or a minimum.

- B#7  
a. (2, 0); maximum  
b. (0, 4); minimum

- c. (0, 4); maximum  
d. (2, 0); minimum

(0, 4) max

(b)

$$y = 4 - x^2$$

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

$$-\frac{b}{2a} = \frac{0}{2(-1)} = 0$$

$$y = 4 - 0^2 = 4$$

a negative

maximum



$x = 0$   $y = c$   
in any quadratic  
in standard form

8. What value of  $c$  makes  $4x^2 + 24x + c$  a perfect square trinomial?

- a. 1 b. 36 c. 144 d. 9

$$\left(\frac{24}{2 \cdot 2}\right)^2 = \left(\frac{24}{4}\right)^2 = 6^2$$

$$(x+3)(x+3) \\ x^2 + 6x + 9 \\ \left(\frac{b}{2}\right)^2$$

$$C = \frac{b^2}{4a}$$

$$\frac{12}{2 \cdot 2}$$

$$(2x+3)(2x+3) \\ 4x^2 + 12x + 9$$

$$\begin{array}{r} (3x+4)(3x+4) \\ 9x^2 + 12x \\ + 12x + 16 \\ \hline 9x^2 + 24x + 16 \\ \left(\frac{24}{2 \cdot 3}\right)^2 \end{array}$$

~~B #6~~  
A

9. Which value of  $c$  makes  $y^2 + 8y + c$  a perfect square?  
a. 4 b. 16 c. 64 d. 8

$$\left(\frac{b}{2}\right)^2 = \left(\frac{8}{2}\right)^2 = 16$$

10.  ~~$y = x^2 - 7x + 12$~~   $y = x^2 - 6x + 8$

Put this graph on the graph paper I give you. Please also find and label the axis of symmetry and the vertex.

① axis of symmetry

$$x = \frac{-b}{2a} = \frac{6}{2(1)} = 3$$

① find vertex

( $\frac{-b}{2a}$  find y, for  $x = \frac{-b}{2a}$ )

$$(3, -1)$$

$$y = 3^2 - 6(3) + 8$$

$$y = 9 - 18 + 8 = -1$$

② crosses x-axis

$$0 = ax^2 + bx + c$$

$$0 = x^2 - 6x + 8$$

$$(x-4)(x-2)$$

$$x-4=0 \quad x-2=0$$

$$x=4 \quad x=2$$

③ crosses y axis at  $(0, c)$

$$(0, 8)$$

