

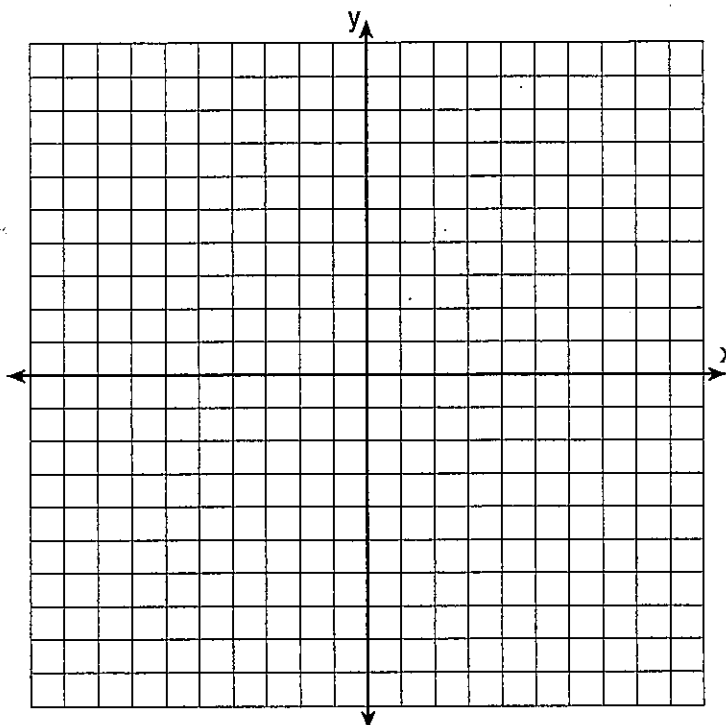
Name: _____

Mrs. Roubos

Date: _____

8A Period _____

Extra Review for Parabola Test



- 1) (a) Draw the graph of the equation $y = x^2 - 6x + 6$ including all values of x in the interval $0 \leq x \leq 6$.
- (b) On the same set of axis, draw the graph of the equation $x + y = 6$.
- (c) Using the graphs drawn in *parts (a) and (b)*, determine the solution of the system:

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

$$x + y = 6$$

- 2) The graphs of the equations $y = x^2$ and $x = 2$ intersect in
- A) 3 points C) 0 points
- B) 1 point D) 2 points

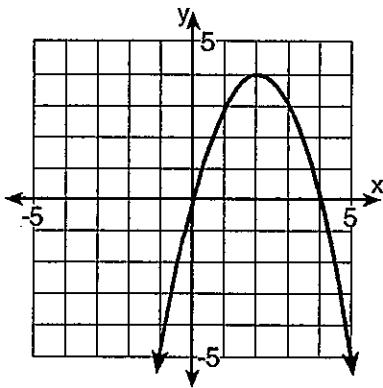
- 3) For the graph of which one of the following equations is $x = 2$ an equation of the axis of symmetry?

- A) $x^2 + 2x - 3 = y$
 B) $3x^2 + 6x - 8 = y$
 C) $x^2 - 4x - 6 = y$
 D) $4x^2 - 2x + 10 = y$

- 4) The graphs of the equations $y = x^2 - 5x + 6$ and $x + y = 6$ are drawn on the same set of axes. At what point do the graphs intersect?

- A) (5,1) C) (2,4)
 B) (3,3) D) (4,2)

- 5) Which of the following statements *best* describes the parabola below?



- A) The axis of symmetry is $x = 2$.
 B) The maximum is at (4,2).
 C) An x-intercept is (0,4).
 D) The minimum is at (2,4).

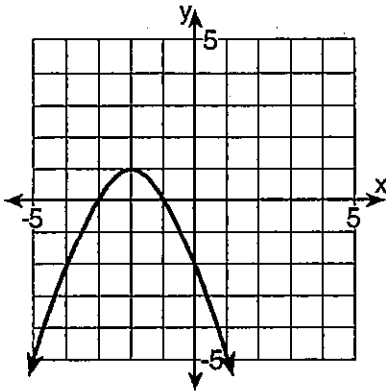
- 6) If $x = 3$ is the equation of the axis of symmetry of the graph of $y = x^2 - 6x + 10$, what is the y-coordinate of the turning point?

- 7) The equation of the axis of symmetry of a parabola is $x = -1$. If the parabola intersects the x-axis at the points whose coordinates are (1,0) and (a,0), find a.

- 8) Find the equation of the axis of symmetry and the coordinates of the turning point for $y = x^2 + 8x - 4$.

- 9) A parabola whose equation is $y = x^2 - 3x + k$ has a turning point with coordinates (2, -4). Find the value of k.

- 10) Which of the following statements *best* describes the parabola below?



- A) The axis of symmetry is $y = 1$.
 B) The maximum is at $(-2, 1)$.
 C) The axis of symmetry is $x = 1$.
 D) An x-intercept is $(-2, 0)$.

- 12) What is an equation of a line that has been translated 2 units down from the graph of $y = x^2 + 3$?

- A) $y = x^2 + 1$ C) $y = x^2 + 2$
 B) $y = x^2 + 3$ D) $y = x^2 - 2$

- 13) Solve the following system of equations and check:

$$y = 6 - x$$

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

- 14) Solve the following system of equations algebraically and check:

$$y = x^2 + 3x + 4$$

$$y - x = 7$$

- 11) When the equation $y = x^2 + 2$ is changed to $y = x^2 - 3$, what is the effect on the graph of the original equation?

- A) The y-intercept is moved 3 units down.
 B) The graph is shifted 3 units to the right.
 C) The graph is shifted 5 units to the left.
 D) The y-intercept is moved 5 units down.

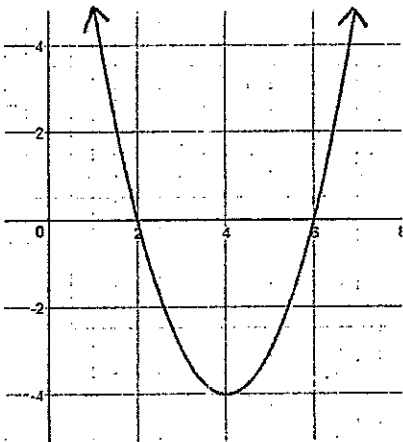
- 15) What is a solution for the following system of equations?

$$y = x + 1$$

$$y = x^2 - 5x + 9$$

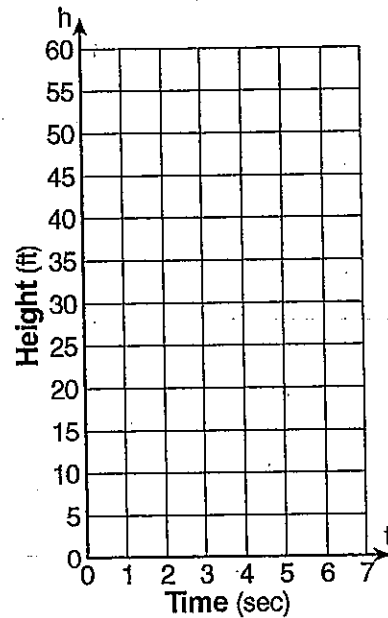
- A) (4,3) C) (1,5)
 B) (3,4) D) (2,3)

- 16) Write the equation of the following parabola by using the provided graph



- 17) Tom throws a ball into the air. The ball travels on a parabolic path represented by the equation $h = -8t^2 + 40t$, where h is the height, in feet, and t is the time, in seconds.

- (a) On the accompanying set of axes, graph the equation from $t = 0$ to $t = 5$ seconds, including all integral values of t from 0 to 5. [Show all work.]



- (b) What is the value of t at which h has its greatest value? [Show all work.]

- 18) Write the quadratic equation in vertex form by completing the square. Then, identify the quadratic's turning point (vertex)

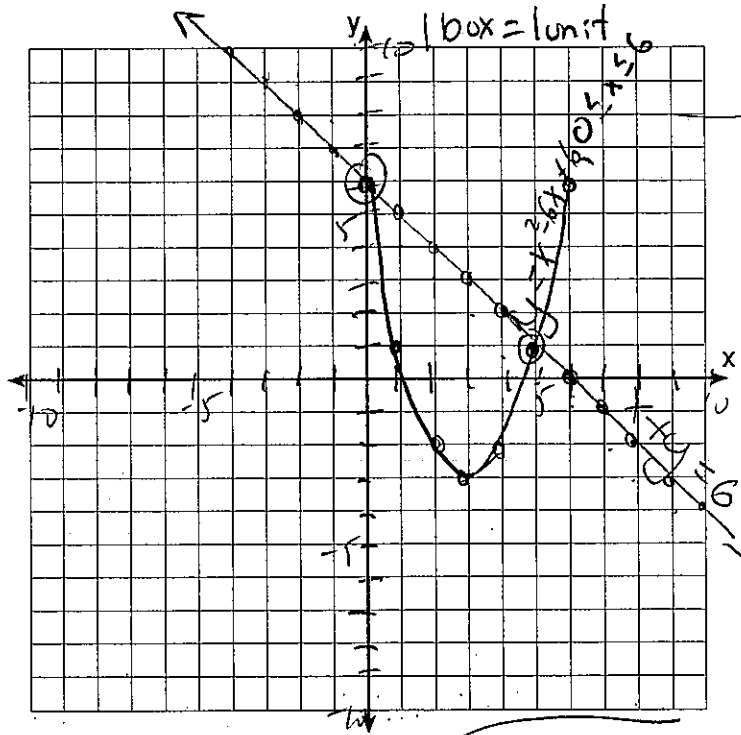
$$y = x^2 - 6x + 2$$

Name: Key

Date: _____
8A Period. _____

Roumbos

Extra Review for Parabola Test



NO ANSWERS B/C Constraints are given

$$\begin{array}{r} x + y = 6 \\ -x \quad -x \\ \hline y = -x + 6 \\ m = -\frac{1}{1} \\ B = 6 \end{array}$$

X	Y
0	6
1	1
2	-2
3	-3
4	-2
5	1
6	6

(0,6)(5,1)

- 1) (a) Draw the graph of the equation $y = x^2 - 6x + 6$ including all values of x in the interval $0 \leq x \leq 6$.
- (b) On the same set of axis, draw the graph of the equation $x + y = 6$.
- (c) Using the graphs drawn in parts (a) and (b), determine the solution of the system:

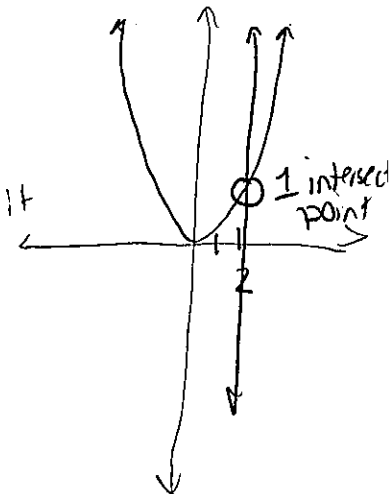
$$\begin{array}{l} y = x^2 - 6x + 6 \\ x + y = 6 \end{array}$$

(0,6)(5,1)

- 2) The graphs of the equations $y = x^2$ and $x = 2$ intersect in
- A) 3 points
B) 1 point
C) 0 points
D) 2 points

$$\begin{array}{l} y = x^2 \\ y = (2)^2 \\ y = 4 \end{array}$$

or graph it



3) For the graph of which one of the following equations is $x = 2$ an equation of the axis of symmetry?

A) $x^2 + 2x - 3 = y$

B) $3x^2 + 6x - 8 = y$

C) $x^2 - 4x - 6 = y$

D) $4x^2 - 2x + 10 = y$

A) $a=1, b=2$

$x = \frac{-b}{2a}$

$x = \frac{-2}{2(1)} = x = -1$

B) $a=3, b=6$

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

$x = -1$

C) $a=1, b=-4$

$x = \frac{-(-4)}{2(1)}$

$x = 2$

$x = 2$

4) The graphs of the equations $y = x^2 - 5x + 6$ and $x + y = 6$ are drawn on the same set of axes. At what point do the graphs intersect?

A) (5,1)

B) (3,3)

C) (2,4)

D) (4,2)

$x + y = 6$

$-x \quad -x$

$y = -x + 6$

$x^2 - 5x + 6 = -x + 6$

$x^2 - 4x = 0$

$x(x-4) = 0$

$x=0$ or $x=4$

$x=0$

$x+y=6$

$0+y=6$

$y=6$

$(0,6)$

$x=4$

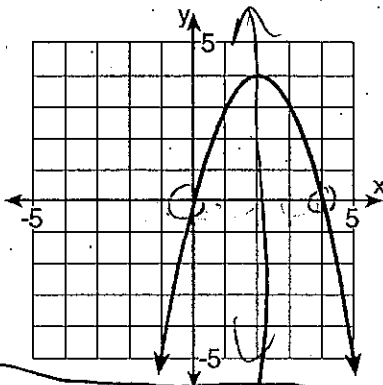
$x+y=6$

$4+y=6$

$y=2$

$(4,2)$

5) Which of the following statements best describes the parabola below?



A) The axis of symmetry is $x = 2$.

B) The maximum is at (4,2).

C) An x-intercept is (0,4).

D) The minimum is at (2,4).

6) If $x = 3$ is the equation of the axis of symmetry of the graph of $y = x^2 - 6x + 10$, what is the y-coordinate of the turning point?

$y = x^2 - 6x + 10$

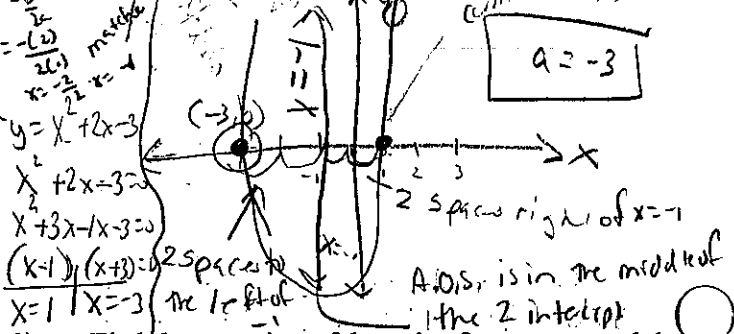
$y = (3)^2 - 6(3) + 10$

$y = 9 - 18 + 10$

$y = 1$

$y = 1$

7) The equation of the axis of symmetry of a parabola is $x = -1$. If the parabola intersects the x-axis at the points whose coordinates are (1,0) and (a,0), find a.



8) Find the equation of the axis of symmetry and the coordinates of the turning point for $y = x^2 + 8x - 4$.

$a=1$

$b=8$

$x = \frac{-b}{2a}$

$x = \frac{-(8)}{2(1)}$

$x = -4$

$x = -4$

$y = x^2 + 8x - 4$
 $y = (4)^2 + 8(4) - 4$
 $y = 16 - 32 - 4$
 $y = -20$
 $(-4, -20)$

9) A parabola whose equation is

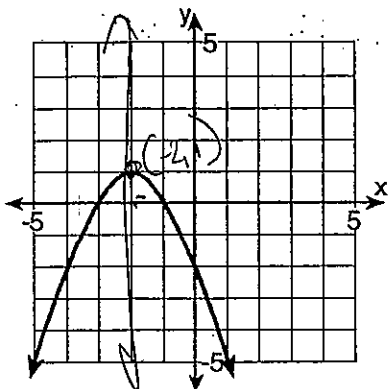
$y = x^2 - 3x + k$ has a turning point with coordinates (2, -4). Find the value of k.

$y = x^2 - 3x + k$
 $-4 = (2)^2 - 3(2) + k$
 $-4 = 4 - 6 + k$
 $-4 = -2 + k$

$k = -2$

$+2 \quad +2$
 $-2 = k$

- 10) Which of the following statements *best* describes the parabola below?



- A) The axis of symmetry is $y = 1$.
 B) The maximum is at $(-2, 1)$.
 C) The axis of symmetry is $x = 1$.
 D) An x-intercept is $(-2, 0)$.

Check #1
 $(0, 6)$
 $y = 6 - x$
 $6 = 6 - 0$
 $6 = 6$
 \checkmark

Check #2
 $(0, 6)$
 $y = x^2 - 6x + 6$
 $6 = (0)^2 - 6(0) + 6$
 $6 = 0 - 6(0) + 6$
 $6 = 0 - 6 + 6$
 $6 = 6$
 \checkmark

Check #3
 $(5, 1)$
 $y = 6 - x$
 $1 = 6 - 5$
 $1 = 1$
 \checkmark

Check #4
 $(5, 1)$
 $y = x^2 - 6x + 6$
 $1 = (5)^2 - 6(5) + 6$
 $1 = 25 - 30 + 6$
 $1 = -5 + 6$
 $1 = 1$
 \checkmark

check

- 11) When the equation $y = x^2 + 2$ is changed to $y = x^2 - 3$, what is the effect on the graph of the original equation?

- A) The y-intercept is moved 3 units down.
 B) The graph is shifted 3 units to the right.
 C) The graph is shifted 5 units to the left.
 D) The y-intercept is moved 5 units down.

$+2 \rightarrow -3 = -5$
 so move \uparrow
 Down 5

Check #1
 $(-3, 4)$
 $y = x^2 + 3x + 4$
 $4 = (-3)^2 + 3(-3) + 4$
 $4 = 9 - 9 + 4$
 $4 = 4$
 \checkmark

Check #2
 $(-3, 4)$
 $y - x = 7$
 $4 - (-3) = 7$
 $4 + 3 = 7$
 $7 = 7$
 \checkmark

Check #3
 $(1, 8)$
 $y = x^2 + 3x + 4$
 $8 = (1)^2 + 3(1) + 4$
 $8 = 1 + 3 + 4$
 $8 = 8$
 \checkmark

Check #4
 $(1, 8)$
 $y - x = 7$
 $8 - 1 = 7$
 $7 = 7$
 \checkmark

- 12) What is an equation of a line that has been translated 2 units down from the graph of $y = x^2 + 3$?

- A) $y = x^2 + 1$
 B) $y = x^2 + 3$
 C) $y = x^2 + 2$
 D) $y = x^2 - 2$

$+3$
 -2 (2 down)
 \hline
 $+1$

- 13) Solve the following system of equations and check:

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

$x = 0$
 $y = 6 - x$
 $y = 6 - 0$
 $y = 6$
 $(0, 6)$

$x = 5$
 $y = 6 - x$
 $y = 6 - 5$
 $y = 1$
 $(5, 1)$

$x^2 - 6x + 6 = 6 - x$
 $+x - 6 \cancel{+6}$

$x^2 - 5x = 0$
 $x(x - 5) = 0$

$x = 0$
 $x - 5 = 0$
 $+5 \quad +5$
 \hline
 $x = 5$

- 14) Solve the following system of equations algebraically and check:

$y = x^2 + 3x + 4$
 $y - x = 7$
 $+x \quad -x$
 \hline
 $y = x + 7$

$x = -3$
 $y - x = 7$
 $y - (-3) = 7$
 $y + 3 = 7$
 $y - 3 = 3$
 \hline
 $y = 4$

$x^2 + 3x + 4 = x + 7$
 $-x - 7 \quad -x - 7$
 \hline

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

$x + 3 = 0$
 $-3 - 3$
 \hline
 $x = -3$

$x - 1 = 0$
 $+1 \quad +1$
 \hline
 $x = 1$

$y = 4$
 $(-3, 4)$
 $x = 1$
 $y - x = 7$
 $y - 1 = 7$
 $+1 \quad +1$
 \hline
 $y = 8$
 $(1, 8)$

15) What is a solution for the following system of equations?

$$y = x + 1$$

$$y = x^2 - 5x + 9$$

- A) (4,3)
B) (3,4)

- C) (1,5)
D) (2,3)

$$x + 1 = x^2 - 5x + 9$$

$$-x - 1 \quad -x - 1$$

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

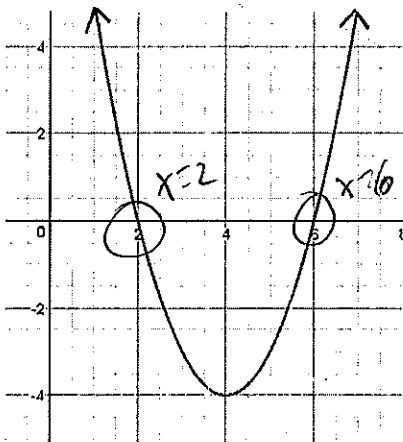
$$x^2 - 6x + 8 = 0$$

$$(x - 4)(x - 2) = 0$$

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

$x = 4$	$x = 2$
$y = x + 1$	$y = x + 1$
$y = 4 + 1$	$y = 2 + 1$
$y = 5$	$y = 3$
(4, 5)	(2, 3)

16) Write the equation of the following parabola by using the provided graph



Work Backwards

$$f(x) = x^2 - 8x + 12$$

$$x^2 - 8x + 12 = 0$$

$$x^2 - 6x - 2x + 12 = 0$$

$$(x - 2)(x - 6) = 0$$

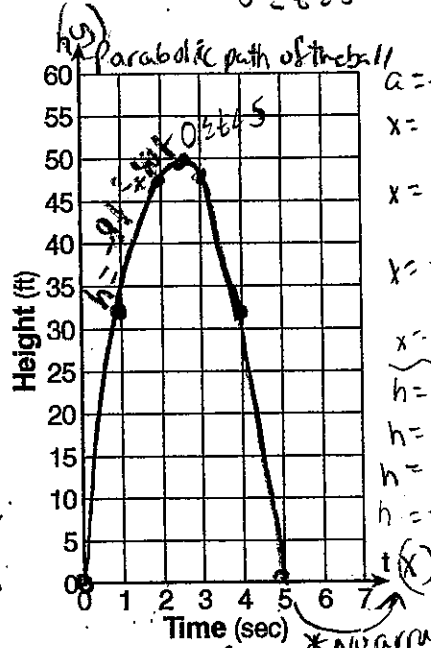
$$x = 2 \quad x = 6$$

17) Tom throws a ball into the air. The ball travels on a parabolic path represented by the equation $h = -8t^2 + 40t$, where h is the height, in feet, and t is the time, in seconds.

(a) On the accompanying set of axes, graph the equation from $t = 0$ to $t = 5$ seconds, including all integral values of t from 0 to 5. [Show all work.]

t	h
0	0
1	32
2	48
2.5	50
3	48
4	32
5	0

to get vertex
2nd Window
P-Tbl = 5



Key
 $x = t$
 $y = h$

$0 \leq t \leq 5$

Parabolic path of the ball

$$a = -8 \quad b = 40 \quad c = 0$$

$$x = \frac{-b}{2a}$$

$$x = \frac{-(40)}{2(-8)}$$

$$x = \frac{-40}{-16}$$

$$x = 2.5$$

$$h = -8t^2 + 40t$$

$$h = -8(2.5)^2 + 40(2.5)$$

$$h = -8(6.25) + 100$$

$$h = -50 + 100$$

$$h = 50$$

(b) What is the value of t at which h has its greatest value? [Show all work.]

2.5 seconds

50 ft

18) Write the quadratic equation in vertex form by completing the square. Then, identify the quadratics turning point (vertex)

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

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

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

$$x^2 - 6x + \left(\frac{-6}{2}\right)^2 = y - 2 + \left(\frac{-6}{2}\right)^2$$

$$x^2 - 6x + 9 = y - 2 + 9$$

$$(x - 3)^2 = y + 7$$

$$y = (x - 3)^2 - 7$$

V: (3, -7)