Name _____ Period _____

5.4A *Graphing Quadratic Inequalities*

#1 – 3: Determine whether each of the given points is a solution to the given quadratic inequality.

1. $y \geq x^2 - 3x + 3$

a) $(0,0)$

$0 \geq (0)^2 - 3(0) + 3$

$0 \geq 3$ False

NOT a SOLN

b) $(1,1)$

$1 \geq (1)^2 - 3(1) + 3$

$1 \geq 1$ TRUE

SOLN

2. $y < -\frac{1}{2}x^2 - x + 6$

a) $(0,0)$

$0 < -\frac{1}{2}(0)^2 - 0 + 6$

$0 < 6$ True

SOLN

b) $(3,3)$

$3 < -\frac{1}{2}(3)^2 - (3) + 6$

$< -\frac{9}{2} - 3 + 6$

$3 < -1\frac{1}{2}$ False

NOT SOLN

3. $y > 2x^2 - x + 4$

a) $(0,0)$

$0 > 2(0)^2 - 0 + 4$

$0 > 4$ False

NOT SOLN

b) $(1,5)$

$5 > 2(1)^2 - (1) + 4$

$5 > 5$ False

NOT SOLN

#4 – 6: For each inequality and graph (the points plotted are points that exist on the boundary)…

- **determine whether the boundary is included as a solution (solid) or not included as part of the solution (dashed).**
- **use a test point to determine the solution region.**

Graph the solution to each inequality.

4. $y \leq x^2 - 4$

use (0,0)

$0 \leq -4$ False

5. $y \geq -2x^2 + 4x - 3$

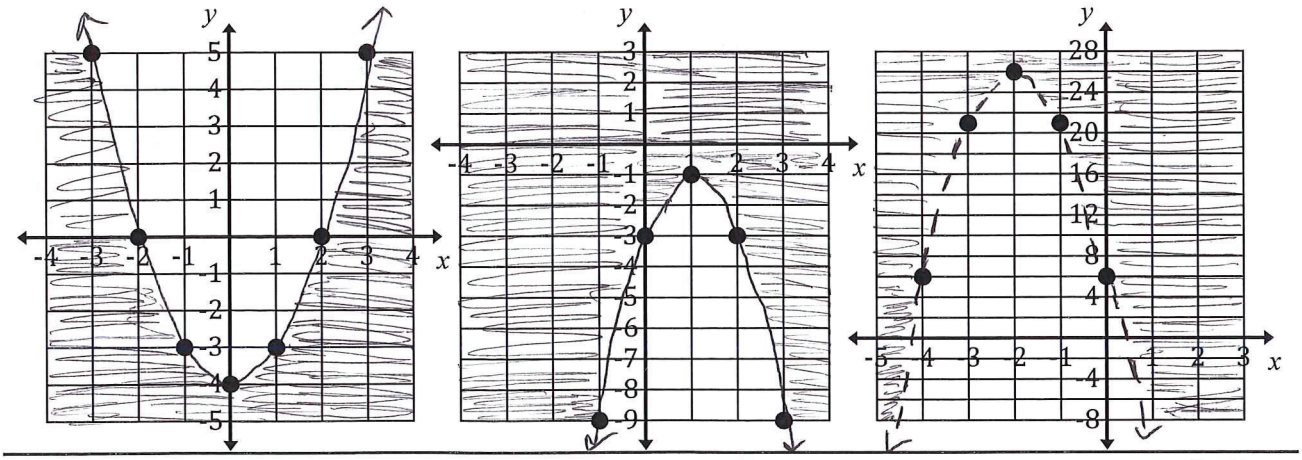
use (0,0)

$0 \geq -3$ True

6. $y > -5x^2 - 20x + 6$

use (0,0)

$0 > 6$ false

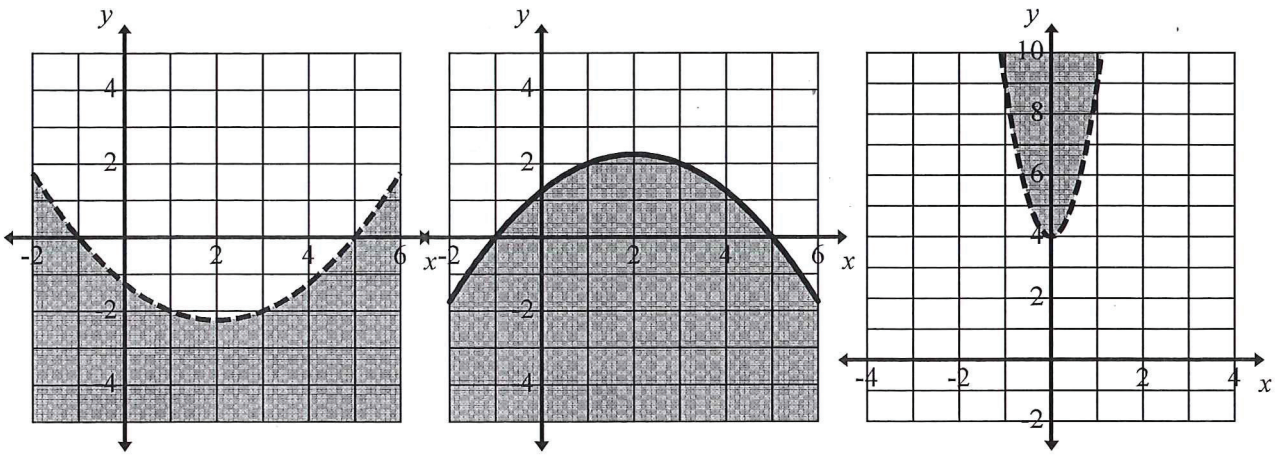


Name _____ Period _____

5.4A *Graphing Quadratic Inequalities*

#7 – 9: Fill in the blank with the appropriate inequality sign.

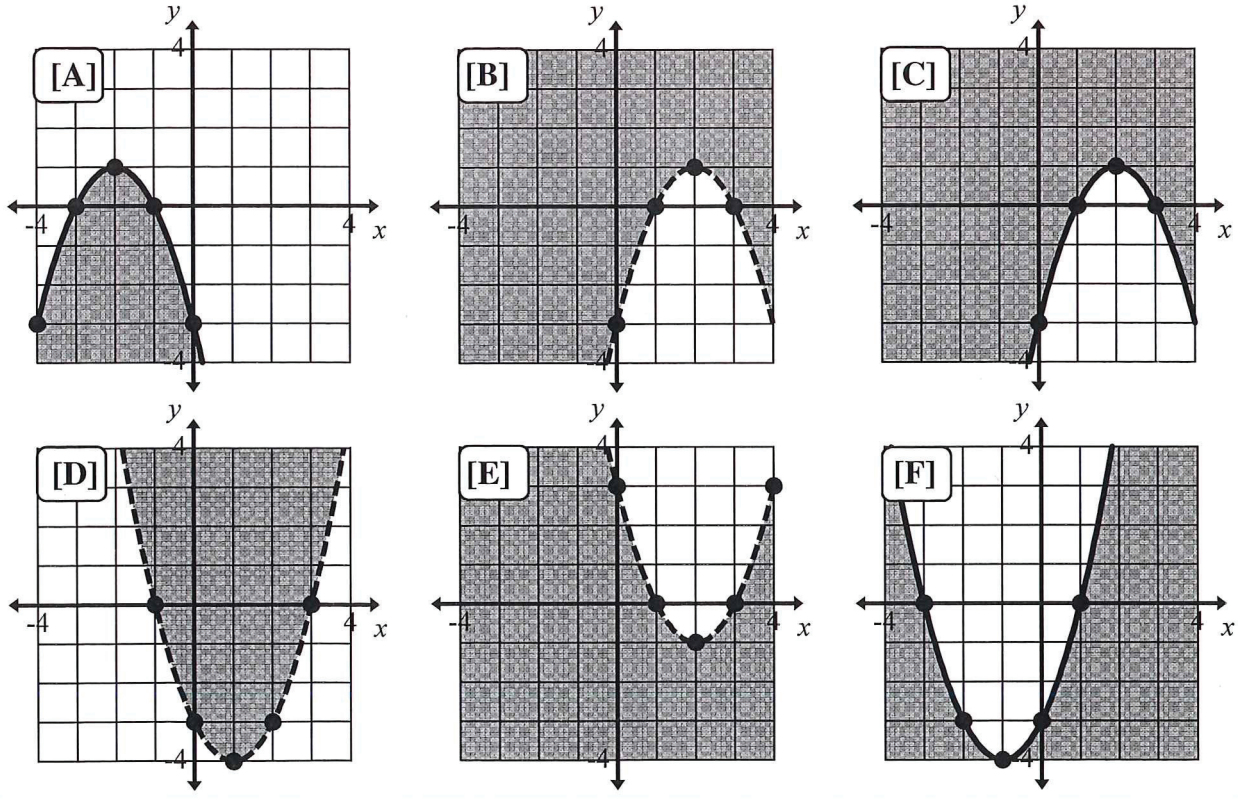
7. y [<] $\frac{1}{4}x^2 - 1x - \frac{5}{4}$ **8.** y [≤] $-\frac{1}{4}x^2 - 1x - \frac{5}{4}$ **9.** y [>] $5x^2 + 4$



#10 – 15: Match the inequality with its graph.

C **10.** $y \geq -x^2 + 4x - 3$ A **11.** $y \leq -x^2 - 4x - 3$ F **12.** $y \leq x^2 + 2x - 3$

E **13.** $y < x^2 - 4x + 3$ B **14.** $y > -x^2 + 4x - 3$ D **15.** $y > x^2 - 2x - 3$



Name _____ Period _____

5.4A *Graphing Quadratic Inequalities*

#16 – 23: Draw the graph of each quadratic inequality. When graphing the boundary, consider the various forms of a quadratic and the significant features that are identified from each form.

16. $y < x^2 - 2x - 1$

$x^2 - 2x = 1$

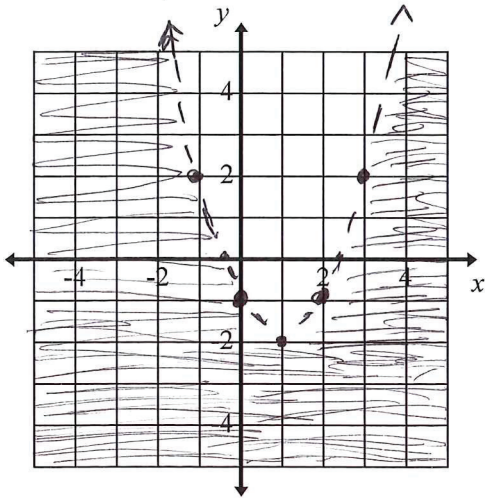
$x^2 - 2x + 1 = 1 + 1$

$\sqrt{(x-1)^2} = \pm\sqrt{2}$

$|x-1| = \sqrt{2}$

$x - 1 = \pm\sqrt{2}$

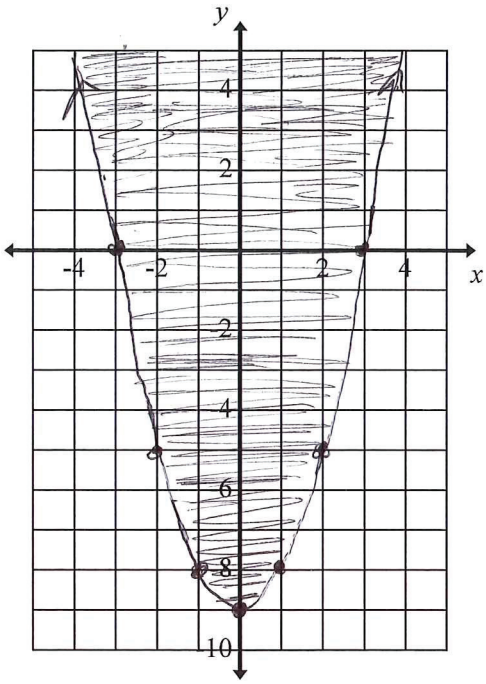
$x = 1 \pm \sqrt{2}$ ← 2.41, −0.41



17. $y \geq x^2 - 9$

$(x+3)(x-3)$

$x = -3, x = 3$

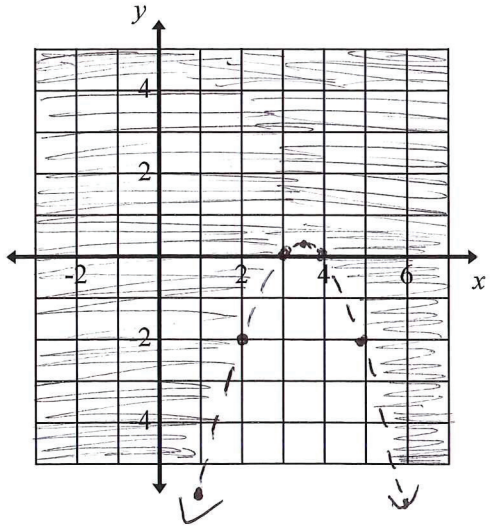


18. $y > -x^2 + 7x - 12$

$0 = -1(x^2 - 7x + 12)$

$0 = -1(x-3)(x-4)$

$x = 3, x = 4$



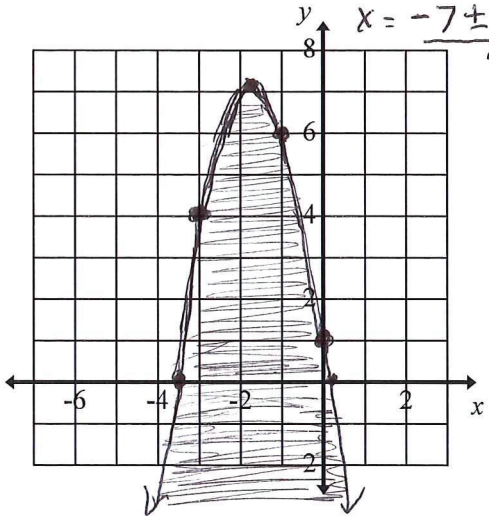
19. $y \leq -2x^2 - 7x + 1$

$a = -2 \quad b = -7 \quad c = 1$

$x = \dfrac{7 \pm \sqrt{(-7)^2 - 4(-2)(1)}}{2(-2)}$

$x = \dfrac{7 \pm \sqrt{57}}{-4}$

$x = \dfrac{-7 \pm \sqrt{57}}{4}$ ← 0.14, −3.64



Name _____ Period _____

5.4A *Graphing Quadratic Inequalities*

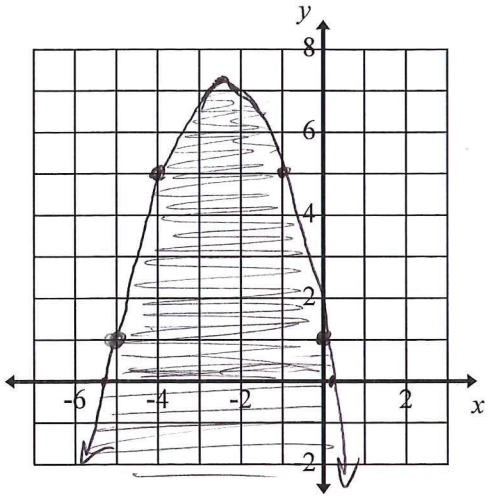
#16 – 23 (continued): Draw the graph of each quadratic inequality. When graphing the boundary, consider the various forms of a quadratic and the significant features that are identified from each form.

20. $y \le -x^2 - 5x + 1$

$a = -1$
$b = -5$
$c = 1$

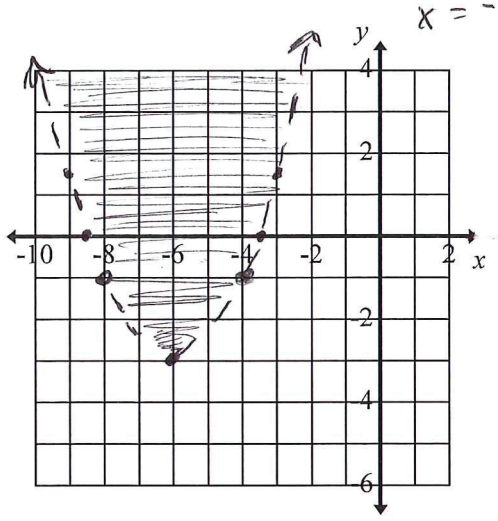
$x = \frac{5 \pm \sqrt{(-5)^2 - 4(-1)(1)}}{2(-1)}$

$x = \frac{5 \pm \sqrt{29}}{-2}$ → -5.19, 0.19



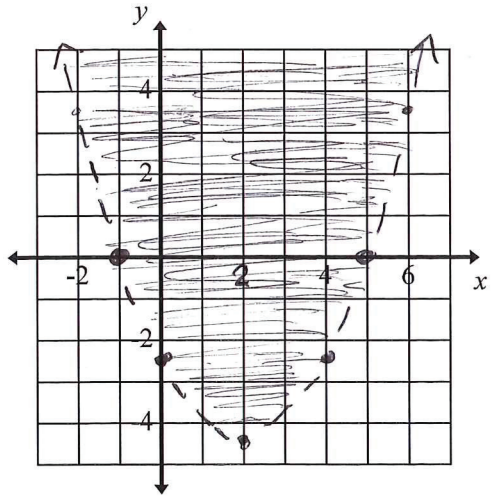
21. $y > \frac{1}{2}(x+6)^2 - 3$

$\frac{1}{2}(x+6)^2 - 3 = 0$
$\frac{1}{2}(x+6)^2 = 3$
$\sqrt{(x+6)^2} = \sqrt{6}$
$|x+6| = \sqrt{6}$
$x = -6 \pm \sqrt{6}$ → -3.55, -8.44



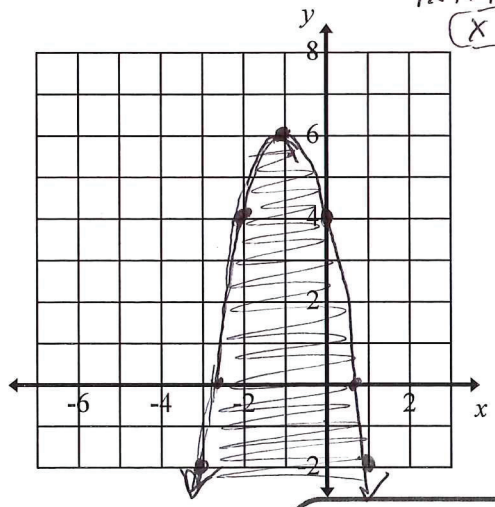
22. $y > \frac{1}{2}(x+1)(x-5)$

$x = -1, x = 5$



23. $y \le -2(x+1)^2 + 6$

$-2(x+1)^2 + 6 = 0$
$-2(x+1)^2 = -6$
$\sqrt{(x+1)^2} = \sqrt{3}$
$|x+1| = \sqrt{3}$
$x = -1 \pm \sqrt{3}$ → 0.73, -2.73



Section 5.4A