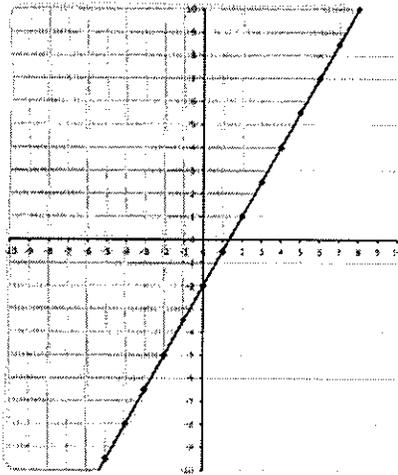


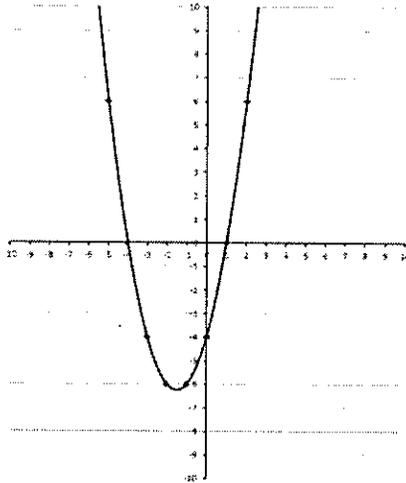
36 - 9.3 Quadratic Inequalities in Two Variables

Part 1 - Three Basic Concepts (9.1, 9.2, 9.3)

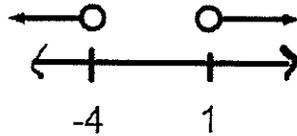
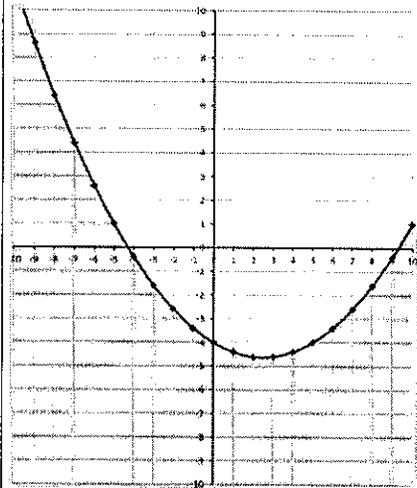
$$y \geq \frac{3}{2}x - 2$$



$$x^2 + 3x - 4 > 0$$



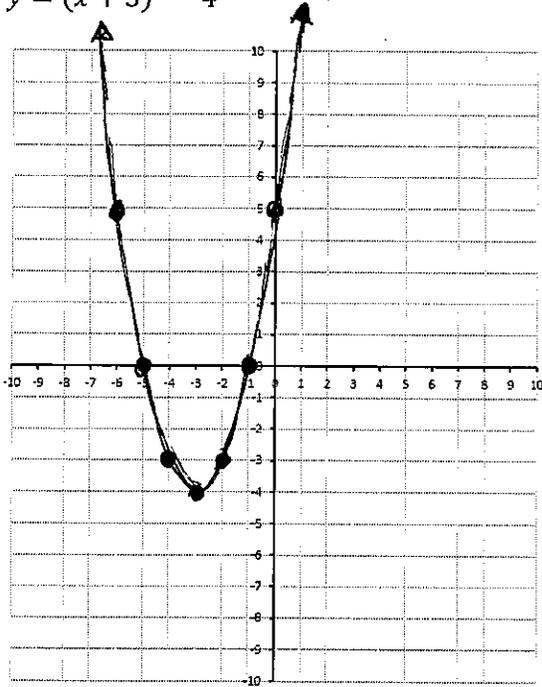
$$y \leq 0.1x^2 - 0.5x - 4$$



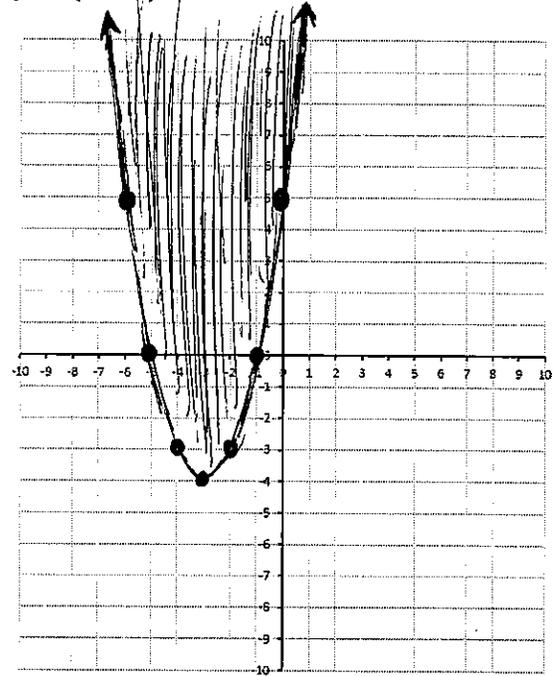
Part 2 – Solving a Quadratic Inequality in Two Variables

Q1: Graph the following equations:

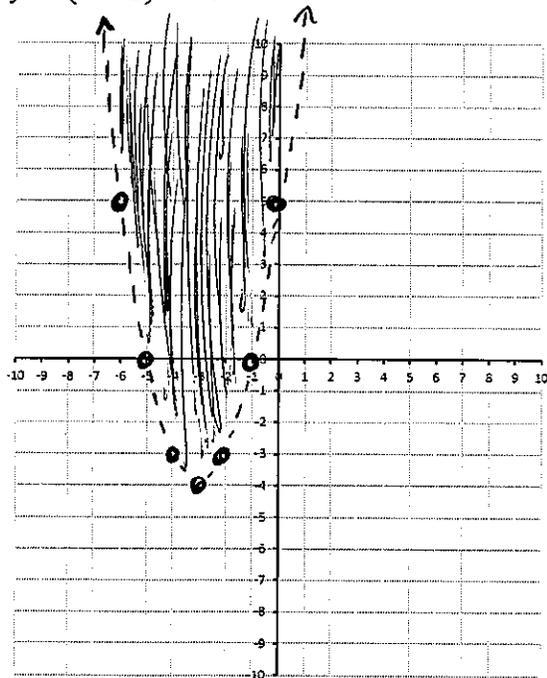
$$y = (x + 3)^2 - 4$$



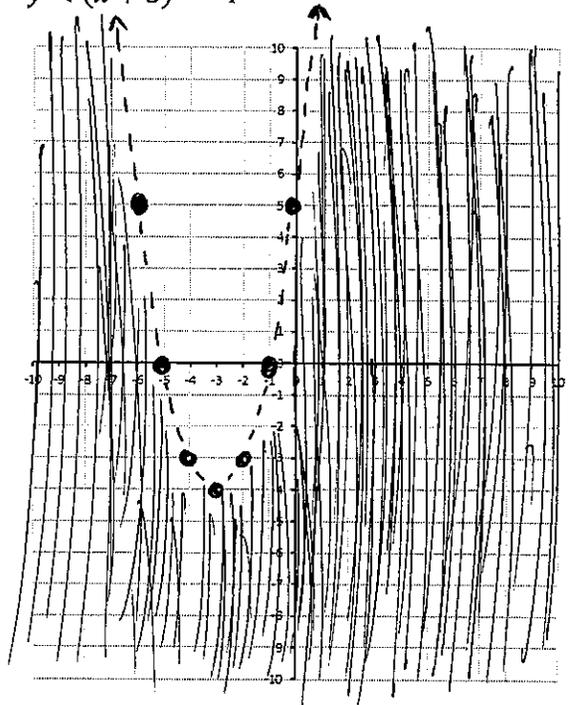
$$y \geq (x + 3)^2 - 4$$



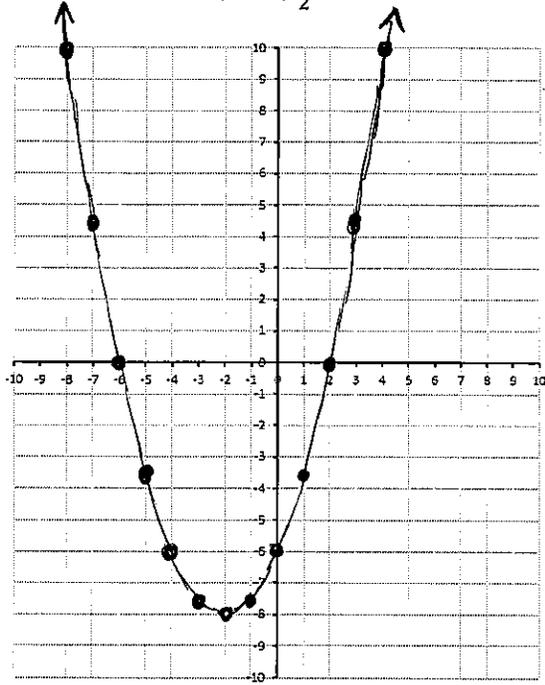
$$y > (x + 3)^2 - 4$$



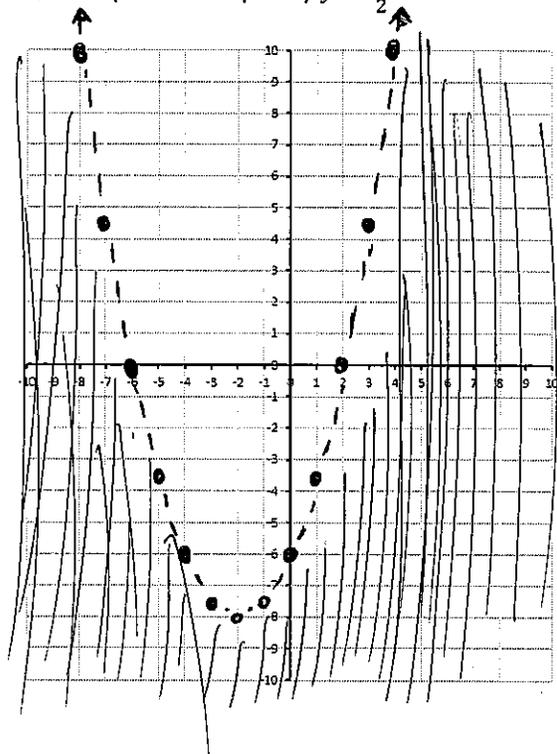
$$y < (x + 3)^2 - 4$$



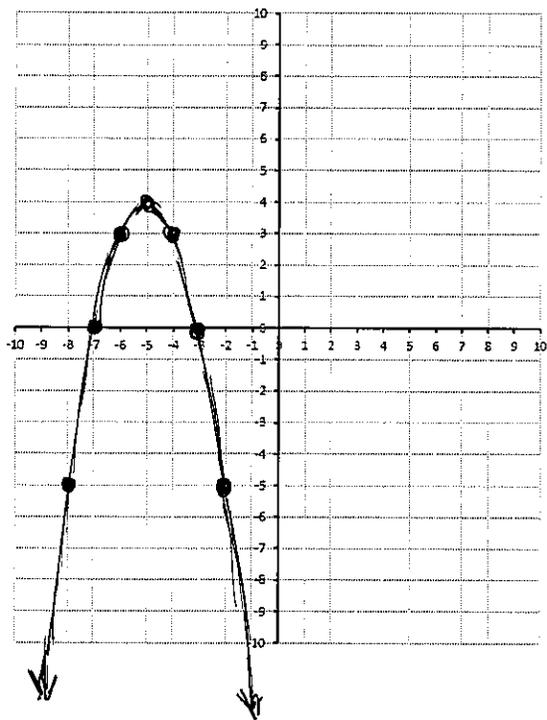
Part 3 – Quadratic Equations in One Variable versus Two Variables

Q2: Solve the inequality $\frac{1}{2}x^2 + 2x - 6 < 0$ Graph $y = \frac{1}{2}x^2 + 2x - 6$ 

$$\{x \mid -6 < x < 2, x \in \mathbb{R}\}$$

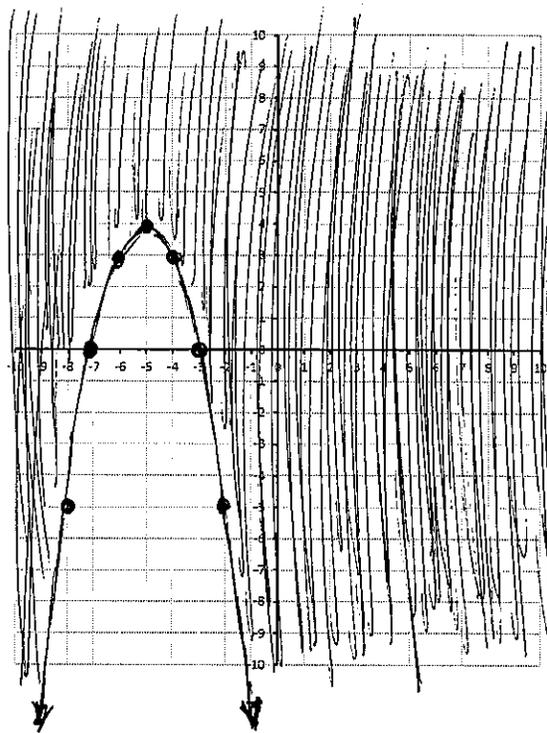
Q3: Graph the inequality $y < \frac{1}{2}x^2 + 2x - 6$ 

Q4: Solve the inequality $-x^2 - 10x - 21 \geq 0$



$$\{x \mid -7 \leq x \leq 3, x \in \mathbb{R}\}$$

Q5: Graph the inequality $y \geq -x^2 - 10x - 21$



Part 4 – Ordered Pairs

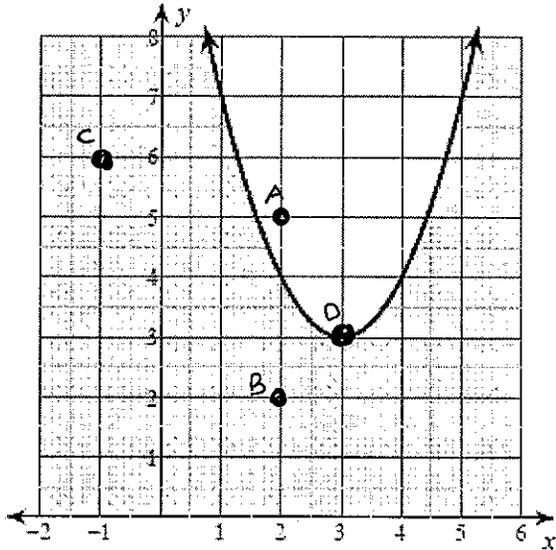
Q6: Which of the following ordered pairs is a solution to the inequality $y \leq x^2 - 6x + 12$?

a. (2,5)

b. (2,2)

c. (-1,6)

d. (3,3)



$$\textcircled{A} \quad 5 \leq (2)^2 - 6(2) + 12$$

$$5 \leq 4 - 12 + 12$$

$$5 \leq 4$$

Nope!

$$\textcircled{B} \quad 2 \leq (2)^2 - 6(2) + 12$$

$$2 \leq 4 - 12 + 12$$

$$2 \leq 4$$

Yep!

$$\textcircled{C} \quad 6 \leq (-1)^2 - 6(-1) + 12$$

$$6 \leq 1 + 6 + 12$$

$$6 \leq 19$$

Yep!

$$\textcircled{D} \quad 3 \leq (3)^2 - 6(3) + 12$$

$$3 \leq 9 - 18 + 12$$

$$3 \leq 3$$

Yep!