Name: _____

Math 111, Intro to Math Methods and Applications – Crawford

Exam 3 - Form B

23 November 2015

Score

1	/12
2	/10
3	/10
4	/24
5	/8
6	/8
7	/10
8	/8
9	/12
Total	/100

- Books or notes (in any form) are not allowed.

- Calculators are not allowed on Part I.

- You may use a calculator on Part II.

- Clearly indicate your answers.

- ***Show all your work*** – partial credit may be given for written work.

- Good Luck!

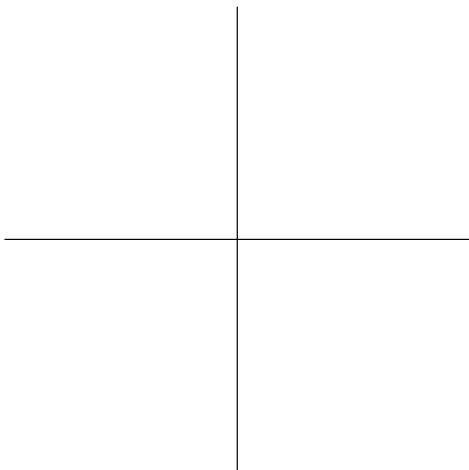**<u>Part I</u>** Calculators are **<u>not</u>** allowed on Part I.

You must completely finish Part I and turn it in before you work on Part II.

1. (12 pts). Given the quadratic function $y = x^2 - 6x + 8$,

(a). Find the (x, y) coordinate of the vertex; Is it a maximum or a minimum?

(b). Find the x- and y- intercepts, if they exist. [If they do not exist, clearly state so.]

(c). Graph the function. Label the vertex and intercepts.

Part II You must completely finish Part I and turn it in before you may use a calculator on Part II. Show all of your work and clearly indicate your answers.

2. (10 pts). Solve the following system of linear equations algebraically (using any method you choose). Show all your work.   [If the system is dependent or has no solution, clearly state so.]

$$\begin{cases} 3x + 8y = 19 \\ 2x - 4y = 15 \end{cases}$$

3. (10 pts). A concert venue has seating for 2000 people. The owner needs to bring in \$42,000 from the sale of 2,000 tickets. They charge \$20 for some seats and \$30 for other seats. How many seats in each price range should they offer for sell?   [Clearly indicate what x and y represent. Write your final answer using the words of the problem.]

4. (24 pts). Solve the following equations using the method indicated. <u>Simplify</u> your answers and leave them in <u>exact</u> form. If no solution exists, clearly state so.

(a). By factoring: $x^2 + 4x = 45$

(b). By using the quadratic formula: $3x^2 - 8x - 11 = 0$

(c). By any method you choose: $4x = x^2$

5. (8 pts). Solve the following inequality and graph the solution on the number on the number line.

$\dfrac{-3x}{5} \geq 4 + x.$

6. (8 pts). Nifty rents a compact car for \$43 per day, and Mavis rents a similar car for \$31 per day plus an initial fee of \$50. For how many days is it cheaper rent from Nifty?

7. (10 pts). Solve the following quadratic inequality. Write the solution in interval notation and graph it on the number line.

$x^2 + 10x + 21 \geq 0$

8. (8 pts). Graph the solution region of the following inequality in two variables.
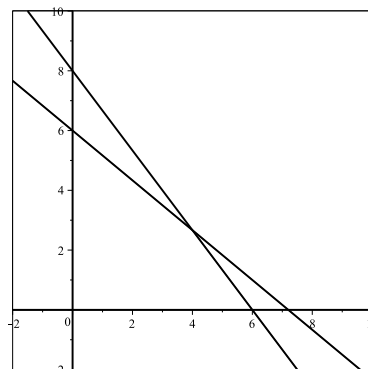
$-3x - 2y \leq -10$
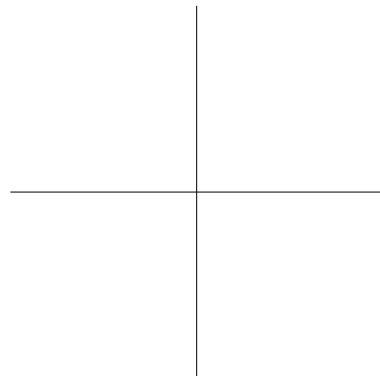
9. (12 pts). The graph of the boundary equations for the following system of inequalities is shown below.

$$\begin{cases} 5x & + & 6y & \geq & 36 \\ 4x & + & 3y & \leq & 24 \\ & & x & \geq & 0 \\ & & y & \geq & 0 \end{cases}$$

(a). Label each line with the correct line from the system of equations.

(b). Shade the feasible region.

(c). Find all of the corners of the feasible region.

(d). Maximize $f = 4x + y$ subject to the same constraints.