Name: _____

Student ID: _____

Exam 3

PLEASE READ ALL THE DIRECTIONS CAREFULLY

- Show all work. Solutions without proper work will receive no credit.
- Present work in a clear, organized manner.
- No notes, books, or calculators allowed.
- Write answers in <u>lowest terms</u> when appropriate
- Good Luck!



Problem	1	2	3	4	5	6	7	Bonus	Total
Score									
Possible	8	10	16	13	16	22	15	10	100

- 1. (8 points) Graph the inequality on the xy-plane. Label all parts of the graph (the y-axis, x-axis, two points, and the boundary line).
 - a. (8 points) 4x + 3y < 6

2. (10 points) Consider the relation:

$$\{(2,-5), (3,-4), (2,0), (1,-5)\}$$

a. (4 points) Given the relation, is it a function? Explain.

b. (6 points) State the domain and range of the relation using set notation.

3. (16 points) Solve the following systems by using the indicated method.

a. (8 points) Solve by substitution.
$$\begin{cases} x - 2y = -4 \\ 3x + y = -5 \end{cases}$$

b. (8 points) Solve by elimination. $\begin{cases} 4x + 3y = \\ 3x + 2y = \end{cases}$	(8	(8	points)	Solve by elimination	on. $\begin{cases} 4x + 3y = 2\\ 3x + 2y = 3 \end{cases}$
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- 4. (13 points) Simplify the expressions.
 - a. (4 points) $7x^3 + 3x^2 2x + x 5x^3 + 1$
 - b. (4 points) $(-2x^2 3x + 9) + (3x^2 2x + 8)$

c. (5 points) $(6x^2 + 11x + 2) - (4x^2 - 2x - 7)$

5. (16 points) Solve the system of linear inequalities by graphing. Label all parts of the graph: y-axis, x-axis, each boundary line.

$$\begin{cases} x+y \le 2\\ 2x-y < 8 \end{cases}$$

- 6. (22 points) Simplify the following expressions so the exponents are positive.
 - a. (3 points) $(6y^4)(5y^5)$
 - b. (5 points) $(-6a^3b^{-4})(4a^{-2}b^8)$

c. (5 points)
$$\left(\frac{3x}{y^{-2}}\right)^{-1}$$

d. (4 points) $(5 \times 10^4)(6 \times 10^3)$

e. (5 points)
$$\frac{16 \times 10^7}{4 \times 10^9}$$

- 7. (15 points) Find each product.
 - a. (6 points) $-x(x^3 + 5x 4)$

b. (4 points) (x - 3)(x + 5)

c. (5 points) $(2x + 1)(x^2 - 7x + 2)$

Bonus: Solve the system.
$$\begin{cases} \frac{x}{5} + \frac{y}{4} = 3\\ \frac{x}{10} - \frac{y}{2} = -1 \end{cases}$$