

MIDTERM 1

Math 110 (Doherty)
October 20, 2006

Name _____

INSTRUCTIONS: PLEASE READ THIS FIRST:

1. Make sure you have a complete exam. The exam has 8 pages, counting this cover page.
2. Show all your work. Use the back of an adjacent page if you need more space.
3. You have 85 minutes.
4. You are not allowed to use a calculator of any kind. Exact answers (e.g., $\frac{13}{7}$) are preferable to decimal approximations.
5. If you have questions, raise your hand and I will assist you as soon as possible.

Good Luck.

Problem	Total Points	Score
1	8	
2	3	
3	10	
4	10	
5	6	
6	12	
7	16	
8	4	
9	10	
10	5	
11	16	
Total	100	

1. (4 pts each) Solve each equation and state the solution set.

(a) $\frac{3}{2}x - 2 = \frac{3}{4}\left(x + \frac{1}{3}\right) - \frac{7}{4}$

(b) $\frac{x+1}{3} - \frac{2x-1}{6} = \frac{1}{2}$

2. (3 pts) Solve $xy + 5 = x + 5z$ for x .

3. (5 pts each) Solve each inequality. Give the solution set both graphically and using interval notation.

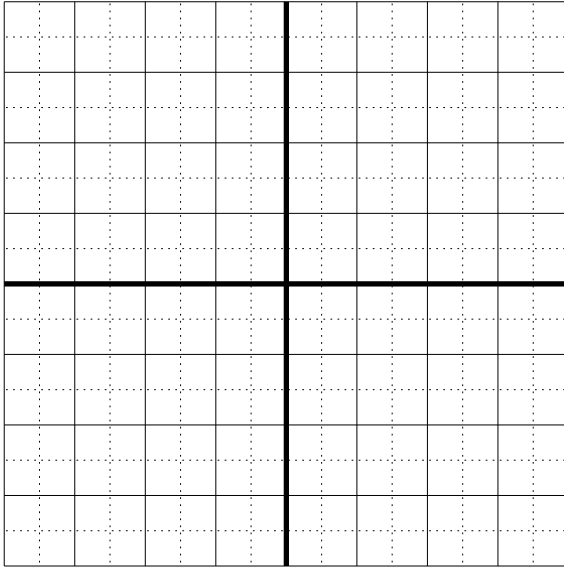
(a) $-1 \leq \frac{3x-2}{5} < 1$

(b) $-\frac{2}{3}x \geq 2$ or $2x + 5 > 7$

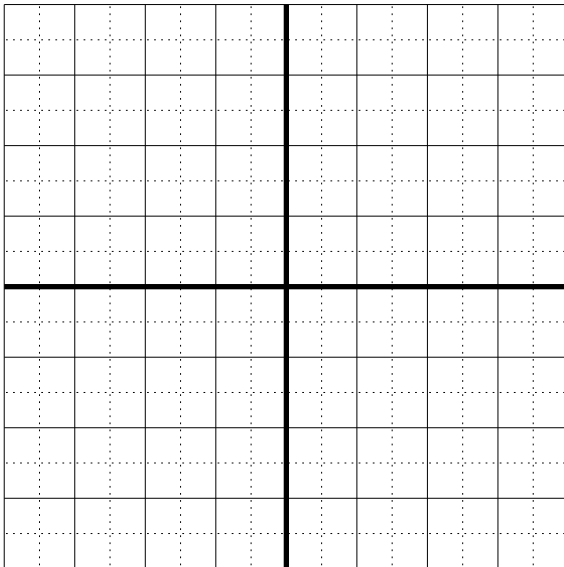
4. (10 pts) While working in your laboratory, you realize you need 5 liters of 8% alcohol solution. However, you only have 5% and 10% alcohol solutions available. How much of each should you mix together to make 5 liters of the 8% solution?
5. (6 pts) The length of a rectangular photo is 2 inches longer than the width. The perimeter is 20 inches. What are the dimensions of the photo?

6. (6 pts each) Write the equation of each line in (i) slope-intercept form and (ii) standard form with integral coefficients. Graph each on the axes provided.

(a) The line through $(-2, 5)$ perpendicular to $y = \frac{2}{3}x - 1$.

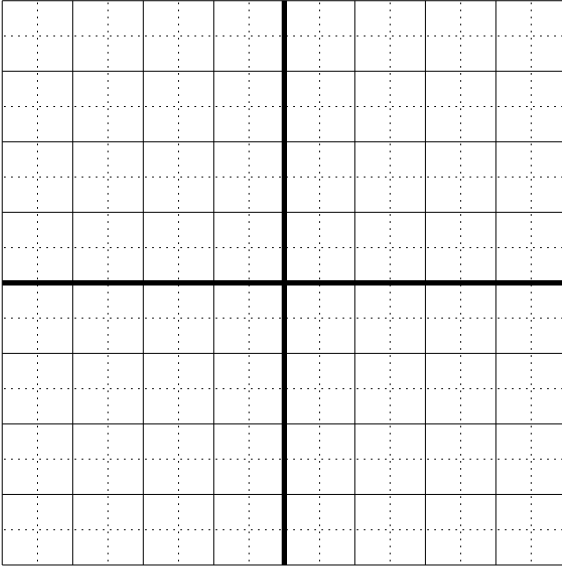


(b) The line through $(-2, 2)$ and $(1, -3)$.

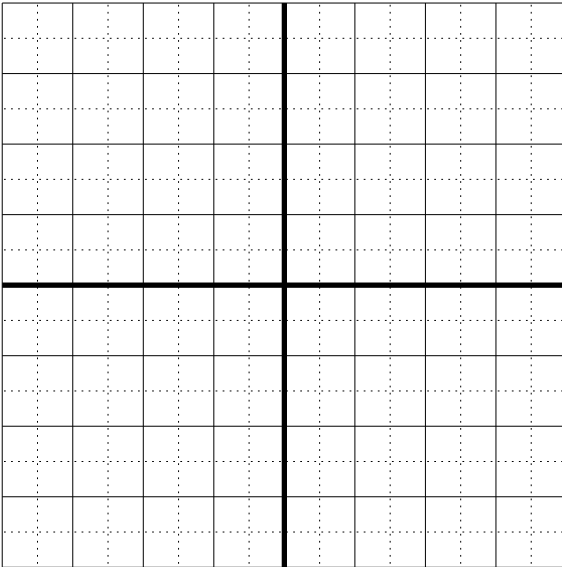


7. (6 pts each) Graph the solution set to each system of linear inequalities on the axes provided.

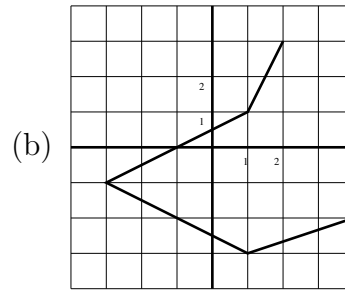
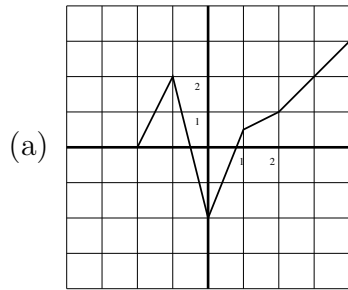
(a) $2 - x \geq 3$ or $2x - 3y > 6$



(b) $2 \leq 2x < 6$ and $-3 < y - 2 \leq 2$



8. (2 pts each) For each of the graphs below, state whether the relation is a function. Explain your answer.



9. Set $f(x) = x - x^2$ and $g(x) = 1 + 3x$.

(a) (2 pts) Compute $f(-2)$

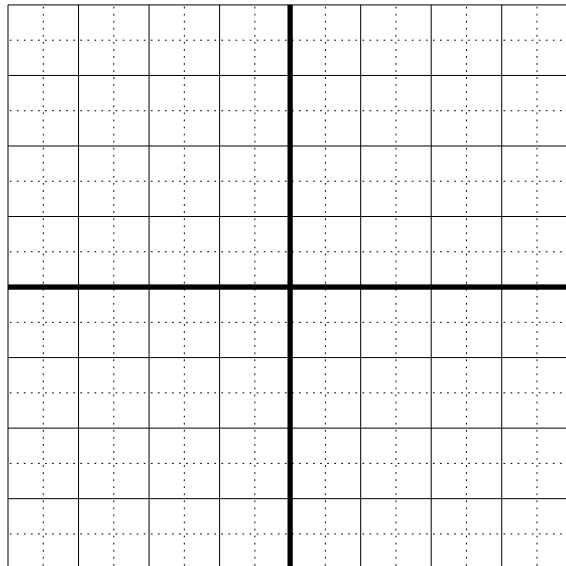
(b) (2 pts) Compute $g(-1)$

(c) (3 pts) Compute $f(-1) \cdot g(1)$

(d) (3 pts) State the domain and range of $g(x)$.

10. (5 pts) Solve the following system of equations by graphing on the axes provided. State the solution set, and classify the system as dependent, independent, or inconsistent.

$$2x - 3y = 3$$
$$y = \frac{2}{3}x - 1$$



11. (4 pts each) Solve each system of equations algebraically, using any method. State the solution set, and classify the system as dependent, independent, or inconsistent.

(a) $2x = 2y + 4$

$$3x - 3y = 3$$

(b) $2x - 3y = 9$

$$3x + y = 8$$

(c) $2x - 3y = 1$

$$-6x + 9y = -3$$

(d) $\frac{1}{4}x + \frac{3}{8}y = \frac{3}{8}$

$$\frac{5}{2}x - 6y = 7$$