Math 1030, Homework Activity #2, Summer 2014 Name KEY
Sections 3.7, 4.1, 2.3

Instructions: Complete the following problems. You may work alone or in a group. Do not just copy answers from a group member, but be sure that you understand the problem. Similar questions will appear on exams. You may be asked to explain or present the answers to the class. This assignment is due at the end of the class period.

1. On the attached graph paper, graph the following linear inequalities.
   a. $y \geq \frac{3}{2}x - 2$
   b. $2x + y \geq -4$
   c. $6x - 8y \geq 24$
   d. $y < \frac{x}{2}$
   e. $x > -1$

   See attached graphs

2. Graph the system of equations on the attached graphs and solve it graphically. Clearly state the solution in (x,y) form if possible, or another appropriate form. State whether the system is consistent/inconsistent, and if applicable, dependent/independent. Use your calculator to verify the solution.
   a. $\begin{cases} x - y = -4 \\ 3x + y = -4 \end{cases}$ (-2,2) Consistent, independent
   b. $\begin{cases} 3x - y = 2 \\ -15x + 5y = -10 \end{cases}$ no solution, inconsistent See attached graphs
   c. $\begin{cases} -2x + 5y = -20 \\ 4x - 10y = 10 \end{cases}$ no solution, inconsistent
   d. $\begin{cases} y = -x + 3 \\ 3y = 2x + 9 \end{cases}$ (0,3) Consistent, independent

3. Solve the equation graphically by graphing both sides of the equation on the attached graphs. Clearly state the solution, if it exists. State whether the equation is conditional, an identity or a contradiction. Use your calculator to verify the solution.
   a. $\frac{2x}{3} + \frac{x+3}{12} = \frac{3x+1}{4}$ all real #'s identity
   b. $-6(x-2) + 8x = -x + 10 - 3x$ Conditional
   c. $\frac{4x-9}{6} - \frac{x}{2} = \frac{x}{6} + 3$ $x = -\frac{1}{3}$ Contradiction no solution

   See attached graphs

4. Use your calculator or approximate the solution to the equation $\pi x - \sqrt{3} = x + \sqrt{2}$. Round your answer to 3 decimal places.

   $x \approx 1.469$

   See attached graph

5. A long distance phone service provider has two different long-distance phone plans. Plan A charges a monthly fee of $8.95 plus $0.05 per minute. Plan B charges a monthly fee of $5.95 and $0.07 per minute. Write the equations that model both plans. Find the number of minutes needed to be charged the same amount under both plans. If you typically use 300 minutes of long distance per month, which plan should you choose? Sketch the graph you obtain from your calculator, and clearly label the solution, and the dimensions on the axes.

$8.95 + .05x = C$
$5.95 + .07x = C$

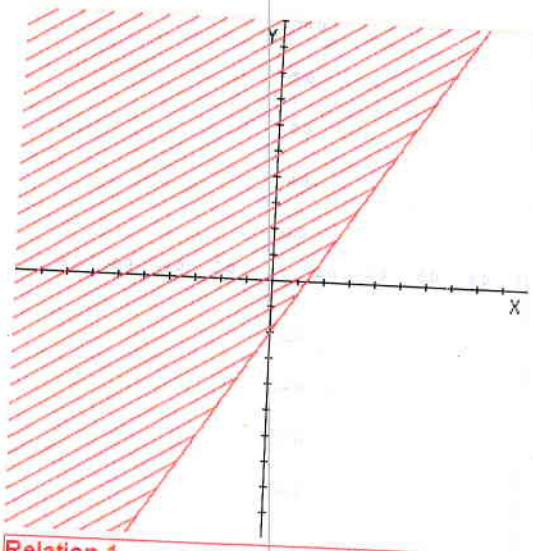
intersects at $x = 150$ minutes

at $x = 300$ minutes, Plan A is cheaper.

graph (attached) has $[0, 500]$ on x
$[0, 50]$ on y.

1.

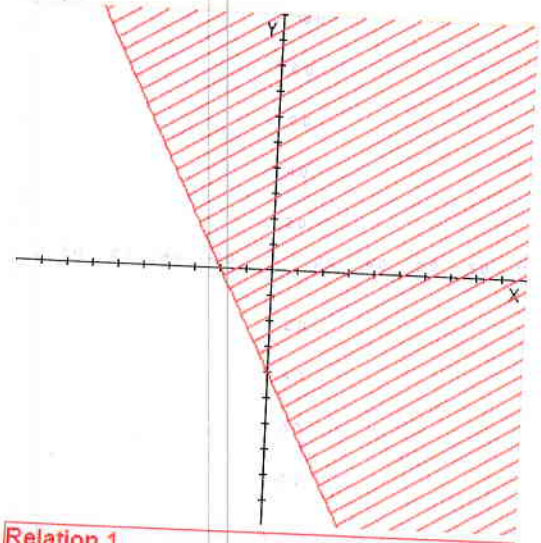
a.



Relation 1

-3 x + 2 y ≥ -4

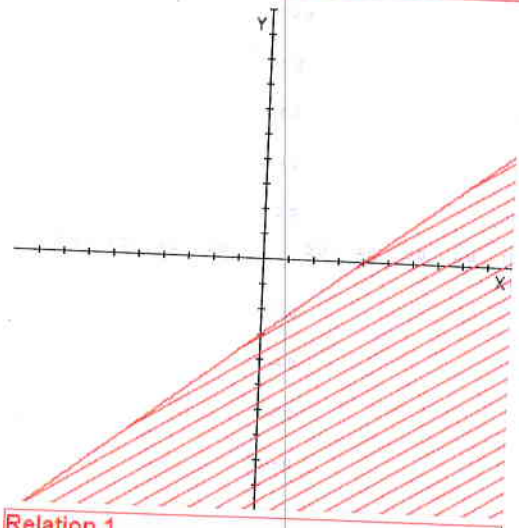
b.



Relation 1

2 x + 1 y ≥ -4

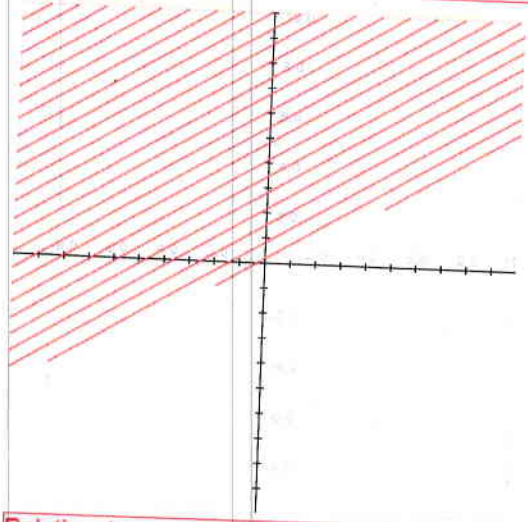
c.



Relation 1

6 x + -8 y ≥ 24

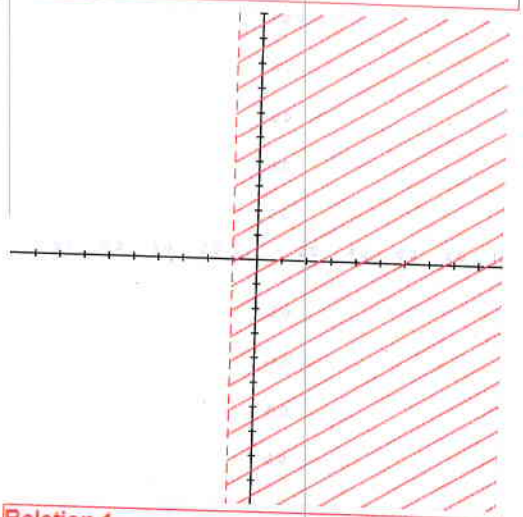
d.



Relation 1

-0.5 x + 1 y < 0

e.

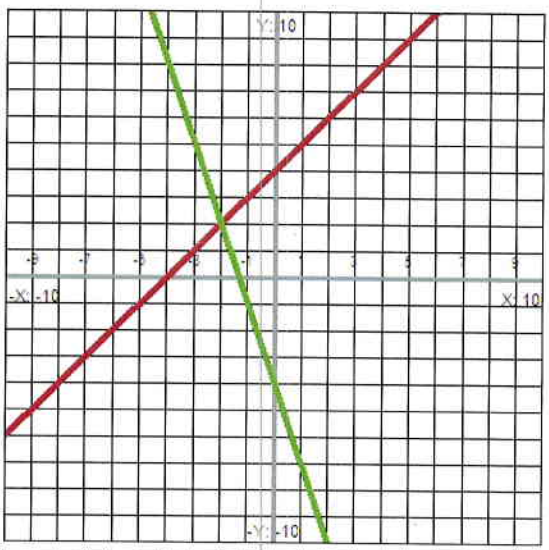


Relation 1

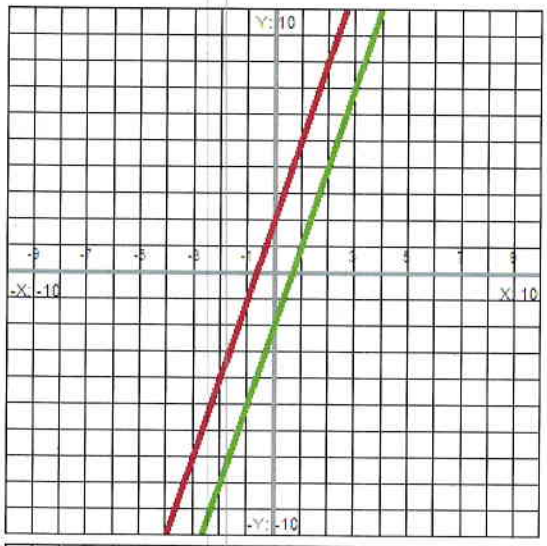
1 x + 0 y > -1

2.

a.


Y: 10
-X: -10
X: 10
-Y: -10

b.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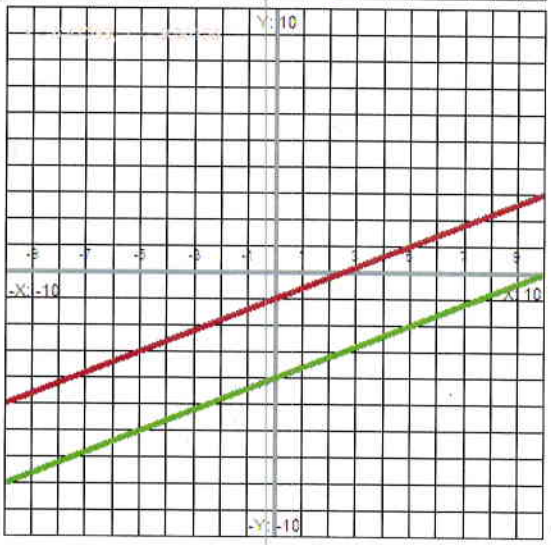
-X: -10
X: 10
-Y: -10

c.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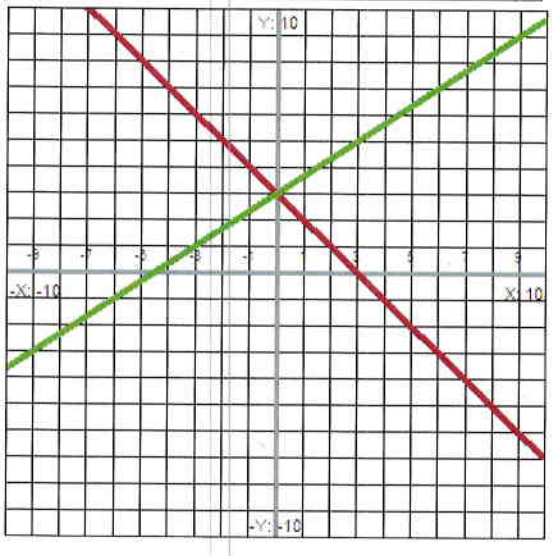
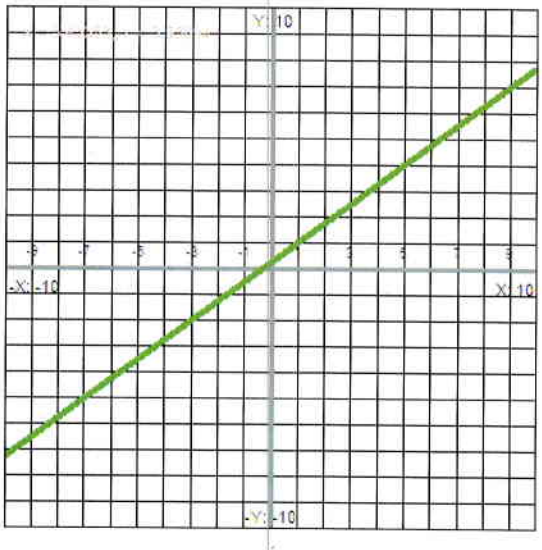
-X: -10
X: 10
-Y: -10

d.

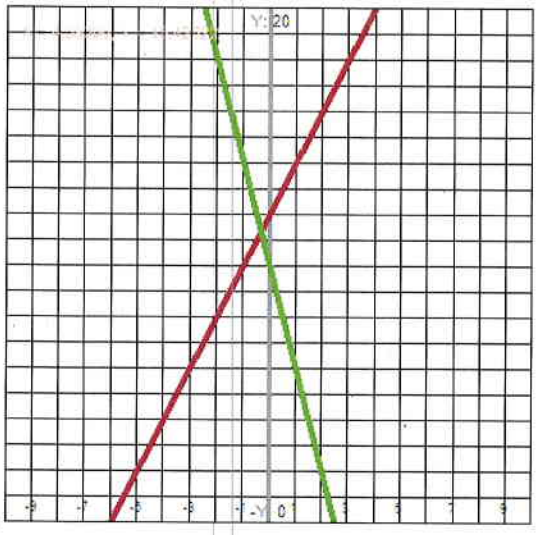

Y: 10
-X: -10
X: 10
-Y: -10

3.

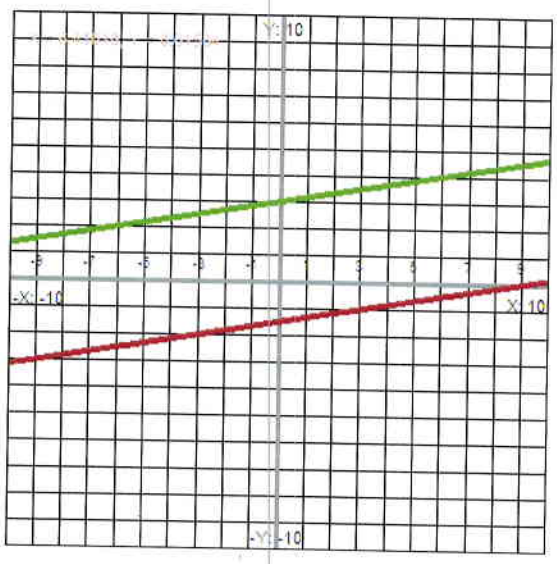
a.


Y: 10
-X: -10
X: 10
-Y: -10

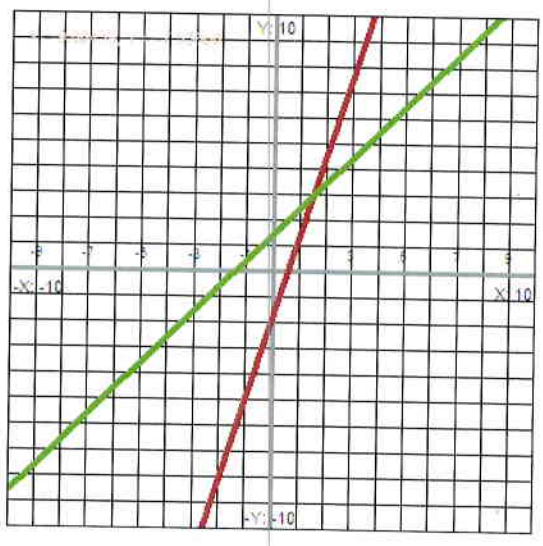
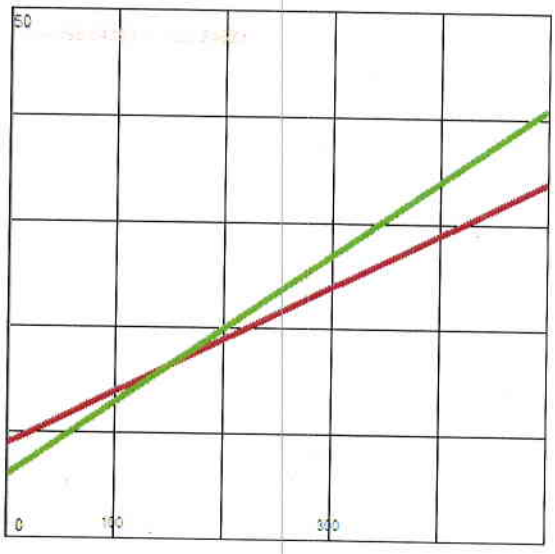
b.


Y: 20
-Y: 0

c.



4.



5.