

## Chapter 3 Review

Write the definitions of the following vocabulary words:

- 1) A. Feasible Region
- B. Solution
- C. Elimination
- D. Substitution
- E. Constraint
- F. Objective Function
- I. System of Equations

Answer the following questions.

- 2) What kinds of lines have no solution? What can you tell me about their slopes?

What kinds of lines have infinitely many solutions? What can you tell me about their slopes?

What kinds of lines have 1 solution? What can you tell me about their slopes?

Solve each system by substitution.

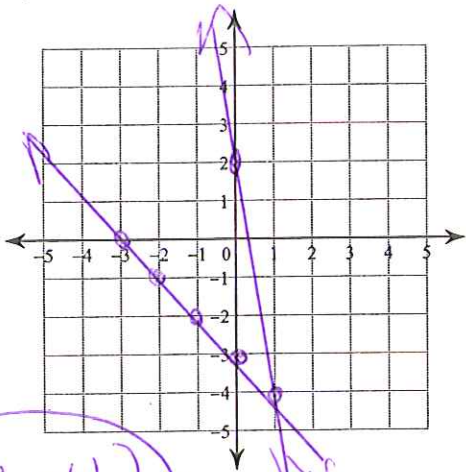
3)  $2x + 3y = -4$   
 $x + y = 0$

$y = -x$

~~$(-4, 4)$~~   $(4, -4)$

Solve each system by graphing. Write your answer as an ordered pair.

4)  $y = -x - 3$   
 $y = -6x + 2$



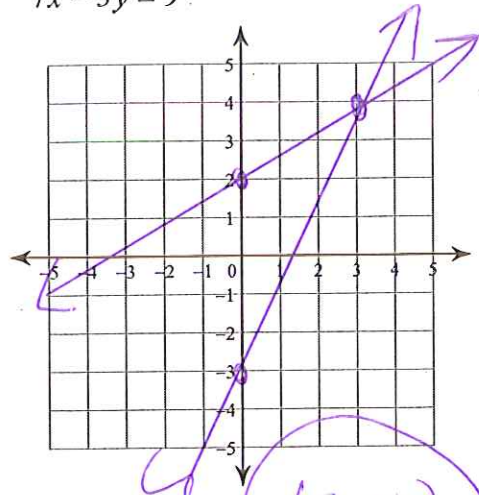
$(1, -4)$

Solve each system by elimination.

6)  $-8x + 9y = -12$   
 $4x - y = 20$

$(6, 4)$

5)  $2x - 3y = -6$   
 $7x - 3y = 9$



$(3, 4)$

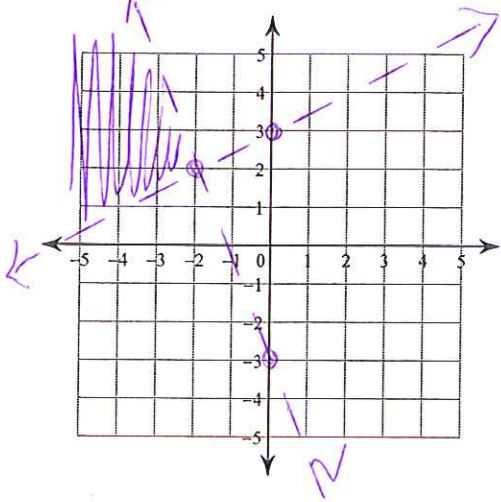
- 7) The school that Alberto goes to is selling tickets to the annual dance competition. On the first day of ticket sales the school sold 2 adult tickets and 7 child tickets for a total of \$77. The school took in \$217 on the second day by selling 13 adult tickets and 14 child tickets. Find the price of an adult ticket and the price of a child ticket.

An adult ticket costs \$7 and a child ticket costs \$9

Sketch the solution to each system of inequalities.

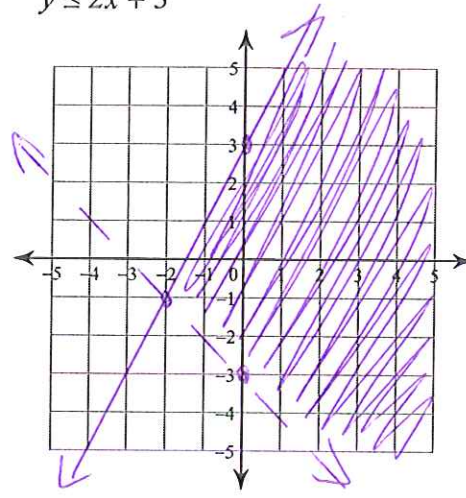
$$8) y > \frac{1}{2}x + 3$$

$$y < -\frac{5}{2}x - 3$$



$$9) y > -x - 3$$

$$y \leq 2x + 3$$



Solve each system by elimination.

$$10) \begin{aligned} 2x + 4y + 2z &= 16 \\ 3x - 6y + 5z &= -8 \\ -2x - 5y + 5z &= -5 \end{aligned}$$

$$(0, 3, 2)$$

flip over!  
→

Graph the feasible region given the following constraints, then find the ordered pair that maximizes the objective function.

11) You need to buy some filing cabinets. You want to maximize the amount of files you can store in your office. Here is what you know:

You know that the plastic cabinets cost \$10 per unit and the wood cabinets cost \$20 per unit. You have at most \$140 to spend on cabinets.

The plastic cabinets require 6 square feet of floor space, and the wood cabinets require 8 square feet of floor space. Your office has room for no more than 72 square feet of cabinets.

The plastic cabinets hold 8 cubic feet of files while the wood cabinets hold 12 cubic feet of files.

A) Define your variables:  $x = \frac{\text{\# of plastic cabinets bought}}{\text{\# of plastic cabinets bought}}$   $y = \frac{\text{\# of wood cabinets bought}}{\text{\# of wood cabinets bought}}$

B) Write an inequality for the constraint on the amount of money you can spend.

$$10x + 20y \leq 140$$

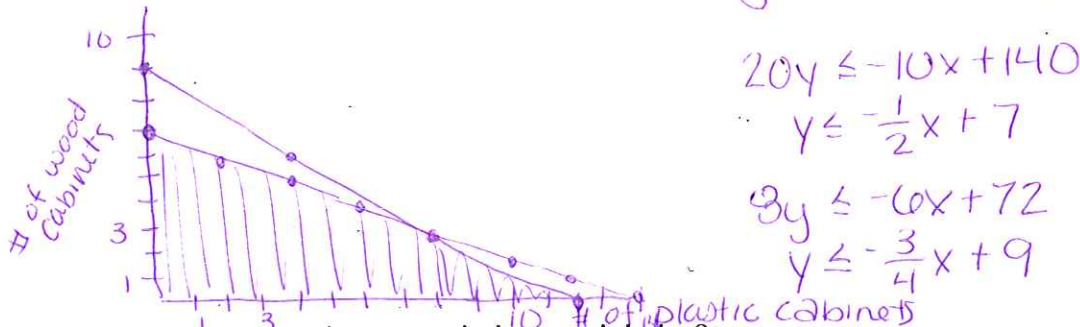
C) Write an inequality for the constraint on the amount of space you have.

$$6x + 8y \leq 72$$

D) Because this is a story problem, we get 2 more constraints for free....what are they?

$x \geq 0$  and  $y \geq 0$  b/c you can't buy negative # of cabinets

E) Graph your constraints.



F) What are we trying to maximize or minimize?

amount of files stored

G) Write an objective function for what we are trying to maximize.

$$\text{Storage} = 8x + 12y$$

H) List the vertices of your feasible region.

$$(0,0) (0,7) (8,3) (12,0)$$

I) How many of each type of cabinet should you order to maximize how many files you can store?

$$(0,7) = 8(0) + 12(7) = 84$$

$$(8,3) = 8(8) + 12(3) = 100$$

$$(12,0) = 8(12) + 12(0) = 96$$

You should buy 8 plastic and 3 wood cabinets.