 Name: _____

2.REV.7 – SYSTEMS OF INEQUALITIES REVIEW

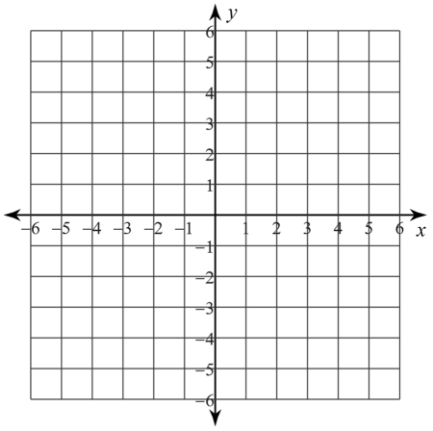
Past due on: _____ Period: _____

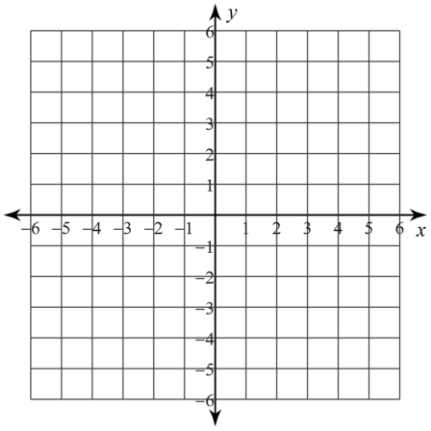
Graph the solution region of the system of linear inequalities.

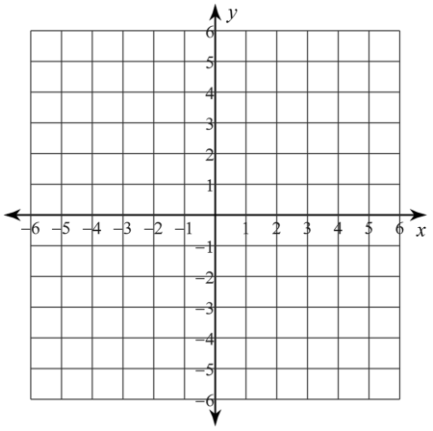
1. $y > 2x + 3$
   $y > 2x - 5$

2. $2x + 3y \leq 9$
   $y \geq 3x - 4$

3. $x + 2y < 12$
   $y < 2x + 1$



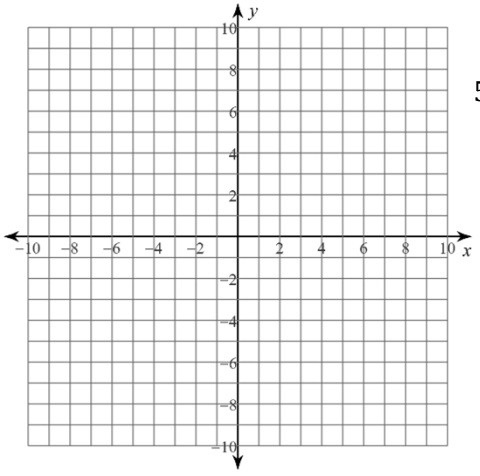




Graph the system of linear inequalities. Name the coordinates of the vertices of the feasible region. Find the maximum and minimum values of the given function for this region.

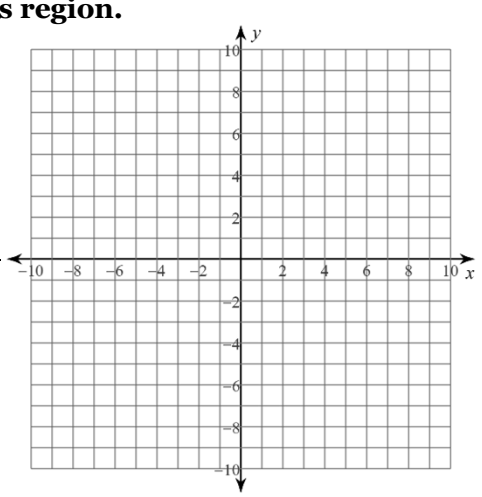
4. $y \leq 4$
   $2x - y \leq 10$
   $y > -x - 4$

(x, y)	$2x - 3y$



5. $y > -4$
   $y \leq x + 1$
   $-x \leq y + 3$
   $y \leq -x + 6$

(x, y)	$x - 4y$



Write a system of linear inequalities.

6. The maximum capacity for an average passenger elevator is 15 people and 3000 pounds. It is estimated that adults weigh approximately 200 pounds and children under 16 weigh approximately 100 pounds. *Let x = adults; y = children.*

	x	y	TOTAL

7. Sofia is making flower arrangements to sell in her shop. She can complete a small arrangement in ½ an hour that sells for $20. She can complete a larger arrangement in 1 hour that sells for $50. Sofia hopes to make at least $250 during her 8-hour workday. *Let x = small arrangements; y = large arrangements.*

	x	y	TOTAL

8. A company manufactures golf clubs. A putter takes 2 hours and $80 to make. A driver takes 2 hours and $120 to make. The company's employees work a total of 72 hours in a day. The daily operating budget is $3000 per day for materials. The company wants to make at least 20 golf clubs. *Let x = putters; y = drivers.*

	x	y	TOTAL

ALL GRAPHING FOR LINEAR PROGRAMMING PROBLEMS SHOULD BE DONE ON WWW.DESMOS.COM

For each of the following problems: (a) write a function to be minimized: $f(x, y)$; (b) write a system of inequalities: (c) graph on Desmos and then find the coordinates of the vertices of the feasible region and substitute them into the function from part a; (d) solve the problem.

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9. Food and clothing are shipped to survivors of a natural disaster.

   Each 20-cubic-foot box of food weights 50 pounds. Each 10-cubic-foot box of clothing weighs 20 pounds.

   The commercial carriers transporting the food and clothing are bound by the following constraints:

   - The total weight per carrier cannot exceed 19,000 pounds.
   - The total volume must be less than 8000 cubic feet.

   Each carton of food will feed 12 people, while each carton of clothing will help 5 people. How many cartons of food and clothing should be sent in each plane shipment to maximum the number of people who can be helped? How many people will be helped?

   Let x = cartons/boxes of food & y = cartons/boxes of clothing

   Write a system of equations & a function to be maximized

	x	y	TOTAL
VOLUME			
WEIGHT			
PEOPLE HELPED			$= f(x, y)$

   Find the coordinates & the vertices & evaluate:

(x, y)	$f(x, y)$

   Answer the problem:

10. An electronics company is manufacturing electronic book readers. A basic model takes 4 hours and $40 to make. A touch screen model takes 6 hours and $120 to make.

    The company's employees work a total of 120 hours each day. The daily operating budget is $1920 for materials. The company would like at least 3 basic models and 8 touch screen models produced each day.

    During a special promotion, the company earns $20 for each basic model sold and $40 for each touch screen model sold. How many of each model should the company produce to maximize their profit? What is the maximum profit?

    Let x = the number of basic models; y = the number of touch screen models

    Write a system of equations & a function to be maximized

	x	y	TOTAL
TIME			
COST			
BASIC ONLY			
TOUCH ONLY			
PROFIT			$= f(x, y)$

    Find the coordinates & the vertices & evaluate:

(x, y)	$f(x, y)$

    Answer the problem: