

## Extra Systems Review

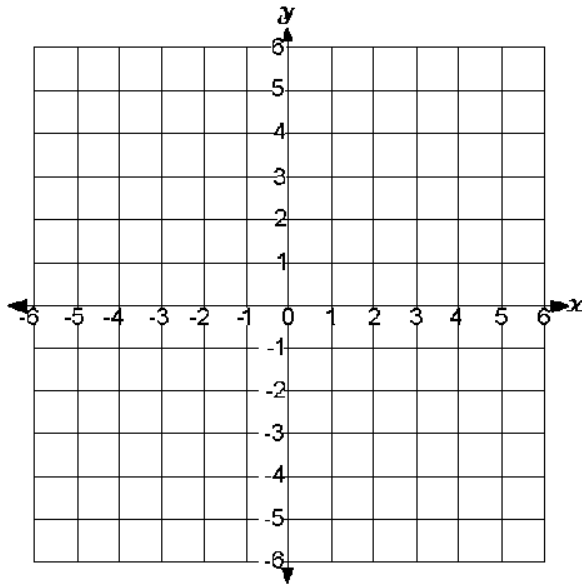
1) Graph the system of inequalities. Name the coordinates of the vertices of the feasible region. Find the maximum and minimum values of the given function for this region.

$$x \leq 5$$

$$y \geq 2$$

$$2x - 5y \geq -10$$

a)



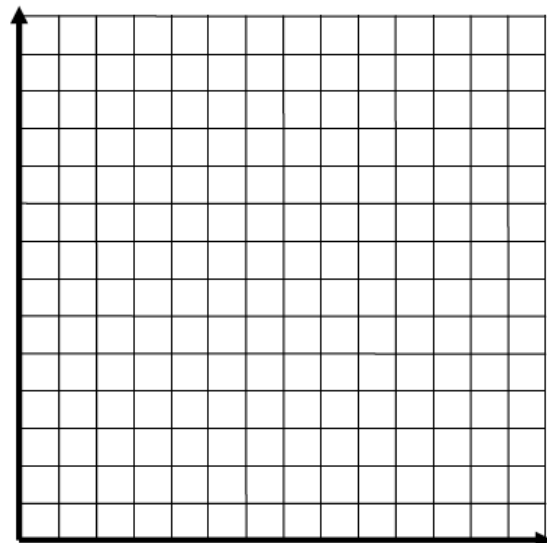
b)  $f(x,y) = 3x + y$

(x,y)    f(x,y)

2) A manufacturer makes two types of jet skis, regular and deluxe. The profit on a regular jet ski is \$100 and the profit on the deluxe model is \$200. To meet customer demand, the company must manufacture at least 50 regular jet skis per week and at least 75 deluxe models. To maintain high quality, the total number of both models of jet skis manufactured by the company should not exceed 150 per week. How many jet skis of each type should be manufactured per week to obtain maximum profit? What is the maximum profit?

List the constraint equation and the inequalities.

Find the maximum profit.



3. Solve the system algebraically.

$$y = x + 4z - 5$$

$$4x + 3y - 2z = 5$$

$$z = -2x + 2$$

4. Solve the system with Cramer's Rule.

$$4x + 4y + z = 24$$

$$2x - 4y + z = 0$$

$$5x - 4y - 5z = 12$$

**Set up and solve.**

5. A triangle has one angle that measures 5 degrees more than twice the smallest angle and the largest angle measures 11 degrees less than 3 times the measure of the smallest angle. Find the measures of the three angles. (Remember that the angles of a triangle add up to 180 degrees)

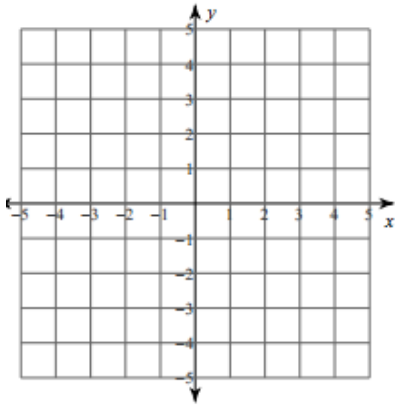
6. I am thinking of two numbers. If you take half of the first number and add it to one-third of the second number, the sum is two. Also, the second number is 3 more than 6 times the first number. What is the product of my two numbers?

7. In yesterday's swim meet, Denton High School dominated in the individual events, with 24 individual event-placers scoring a total of 56 points. A first place finish scores 5 points, second place scores 3 points and a third place finish earns 1 point. Having as many third place finishers as first and second place finishers combined shows the team's depth! How many first place, second place, and third place finishers did Denton High receive?

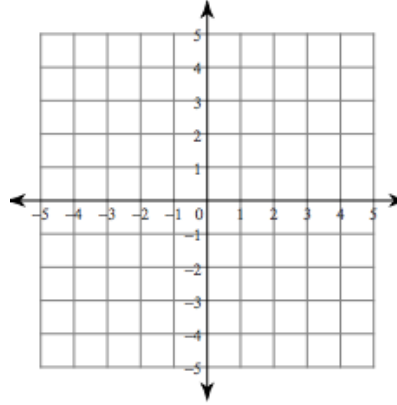
8. Sara has \$36 in \$1, \$5, and \$10 bills. She has the same number of \$5 bills as \$10 bills, and she has 10 bills in all. How many bills of each denomination does she have?

**Graph the solution to the system of inequalities.**

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



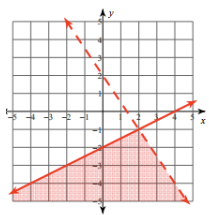
10.  
 $x \leq -3$   
 $5x + 3y \geq -9$



**Answers**

1. min 2; max 19
2. max profit: \$25,000
3. (0, 3, 2)
4. (4, 2, 0)
5. 31, 67, and 82 degrees
6. product: 54/25
7. 1<sup>st</sup> place: 4, 2<sup>nd</sup> place: 8; 3<sup>rd</sup> place: 12
8. 6 \$1 bills, 2 \$5 bills, 2 \$10 bills

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



10.  
 $x \leq -3$   
 $5x + 3y \geq -9$

