

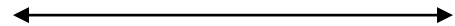
Unit 10 Practice Test

Show all work!

Solve and graph the following.

1)  $-1 \leq 2x + 5 < 9$

1) \_\_\_\_\_



2) Claire has received scores of 85, 88, 87, and 95 on her algebra tests. What is the minimum score she must receive on her fifth test to have an overall test score of at least 90?

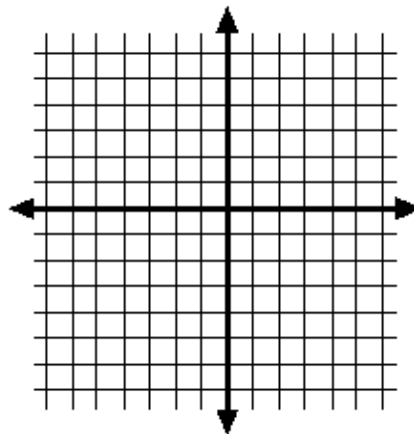
2) \_\_\_\_\_

3) Solve the system of equations by graphing.

3) \_\_\_\_\_

$4x + 3y = 9$

$-2x + 2y = -8$



4) Solve using the substitution method.

4) \_\_\_\_\_

$x + 6y = 36$

$-7x + 7y = 42$

5) Solve by using the addition (elimination) method.

5) \_\_\_\_\_

$x - 3y = -15$

$-4x - 3y = 0$

6) Solve by using the method of your choice.

6)\_\_\_\_\_

$$3x + y = 12$$

$$y = 9 - 3x$$

7) Jamie always throws loose change into a pencil holder on his desk and takes it out every two weeks. This time it is all nickels and dimes. There are 4 times as many dimes as nickels, and the value of the dimes is \$3.85 more than the value of the nickels. How many nickels and dimes does Jamil have?

7)\_\_\_\_\_

8) Robin is having her yard landscaped. She obtained an estimate from two landscaping companies. Company A gave an estimate of \$180 for materials and equipment rental plus \$45 per hour for labor. Company B gave an estimate of \$260 for materials and equipment rental plus \$35 per hour for labor. Create a cost equation for each company where  $y$  is the total cost of the landscaping and  $x$  is the number of hours of labor. Determine how many hours of labor will be required for the two companies to cost the same.

8)\_\_\_\_\_

9) A textile company has specific dyeing and drying times for its different cloths. A roll of Cloth A requires 60 minutes of dyeing time and 50 minutes of drying time. A roll of Cloth B requires 65 minutes of dyeing time and 30 minutes of drying time. The production division allocates 3260 minutes of dyeing time and 2040 minutes of drying time for the week. How many rolls of each cloth can be dyed and dried?

9)\_\_\_\_\_

10) Benjamin never has more than 24 hours free during the week. He is trying to make a weekly plan for dividing his free time between reading and working out. He wants to spend at least 4 hours per week reading. Write a system of inequalities to describe the situation. Let  $x$  = amount of time for reading and  $y$  = amount of time for working out.

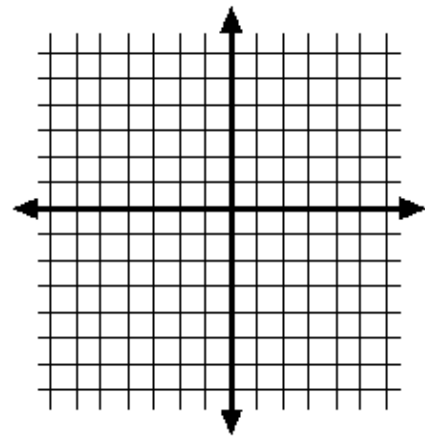
- |                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|
| $x + y \leq 24$ | $x + y \leq 24$ | $x + y \leq 24$ | $x + y \leq 24$ |
| a) $x \geq 4y$  | b) $y \geq 4$   | c) $x \geq 4$   | d) $x \leq 4y$  |
| $x \geq 0$      | $x \geq 0$      | $y \geq 0$      | $x \geq 0$      |
| $y \geq 0$      |                 |                 | $y \geq 0$      |

10) \_\_\_\_\_

11) Graph the system of inequalities.

$$5x + 10y \leq 10$$

$$2x + y \leq 6$$



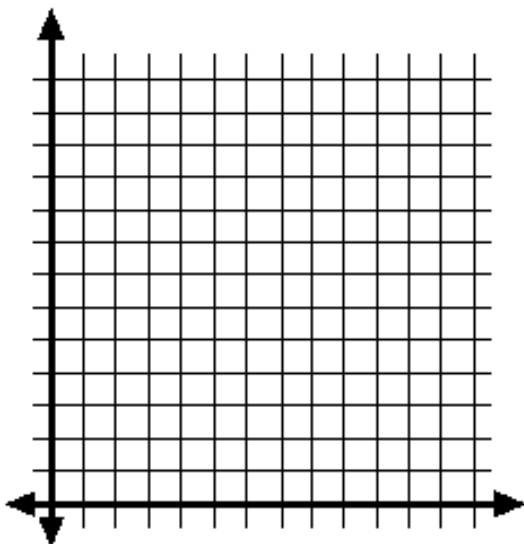
12) An objective function and a system of linear inequalities representing constraints are given. Graph the system of inequalities representing the constraints. Find the value of the objective function at each corner of the graphed region. Use these values to determine the maximum value of the objective function and the values of  $x$  and  $y$  for which the maximum occurs.

Objective function:  $z = 15x + 8y$

$$0 \leq x \leq 10$$

$$\text{Constraints: } 0 \leq y \leq 5$$

$$3x + 2y \geq 6$$



12) \_\_\_\_\_

**Write a system of two inequalities that describe the constraints in the problem.**

13) An office manager is buying used filing cabinets. Small file cabinets cost \$6 each and large file cabinets cost \$11 each, and the manager cannot spend more than \$115 on file cabinets. A small cabinet takes up 5 square feet of floor space and a large cabinet takes up 8 square feet, and the office has no more than 90 square feet of floor space available for file cabinets. The manager must buy at least 5 file cabinets in order to get free delivery. Let  $x$  = the number of small file cabinets bought and  $y$  = the number of large file cabinets bought.

a)  $6x + 11y \leq 115; 5x + 8y \leq 90; x + y \geq 5$

13) \_\_\_\_\_

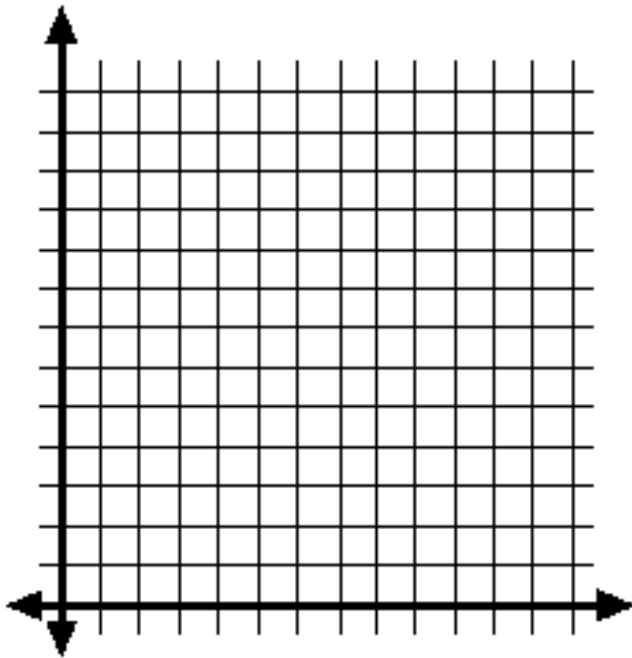
b)  $6x + 11y \leq 115; 8x + 5y \leq 90; x \geq 5$

c)  $6x + 11y \leq 115; 5x + 8y \leq 90; y \geq 5$

d)  $6x + 11y \leq 115; 5x + 8y \leq 90; x + y \leq 5$

**Use linear programming to solve the following.**

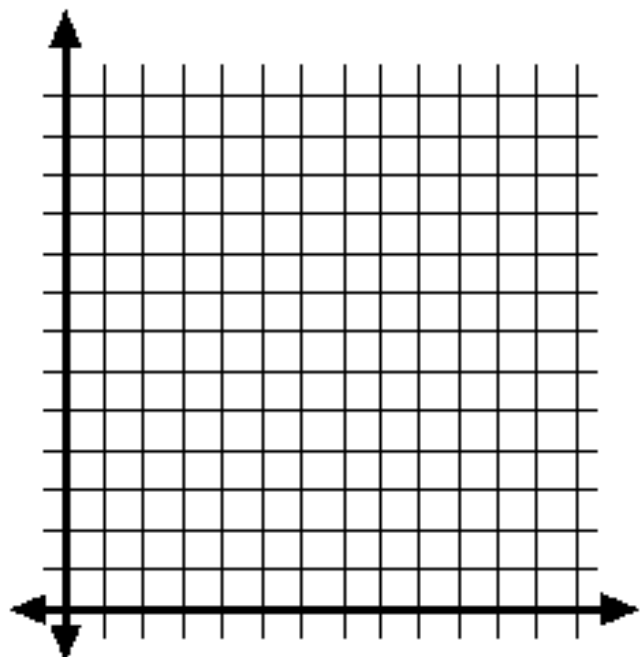
14) Bruce is bringing items to sell at a flea market, where he plans to sell televisions at \$125 and Blu-Ray players at \$100 each. Due to space limitations he can only store at most 150 items for the day. However, because more people already own televisions, Bruce knows that the number of Blu-Ray Player sales must at least match the number of television sales. How many of each item should Bruce bring to the flea market to maximize his sales?



14) \_\_\_\_\_

15) The Acme Class Ring Company designs and sells two types of rings: the VIP and the SST. They can produce up to 24 rings each day using up to 60 total man-hours of labor. It takes 3 man-hours to make one VIP ring and 2 man-hours to make one SST ring. How many of each type of ring should be made daily to maximize the company's profit, if the profit on a VIP ring is \$30 and on an SST ring is \$60?

15) \_\_\_\_\_



16) Wally's Warehouse sells trash compactors and microwaves. Wally has space for no more than 100 trash compactors and microwaves together. Trash compactors weigh 22 pounds and microwaves weigh 110 pounds. Wally is limited to a total of 7040 pounds for these items. The profit on a microwave is \$75 and on a compactor is \$49. How many of each should Wally stock to maximize profit potential?

16) \_\_\_\_\_

