Name_____Period_____Date_____

NON-CALCULATOR SECTION

Vocabulary: Define each word and give an example.

1. Solution of a System of Linear Inequalities

2. Coincident Lines

Short Answer:

3. Explain how to tell if a linear system has one, none, or infinitely many solutions when solving it algebraically.

4. What is the first step for solving a system of linear equations by linear combinations?

Review:

5. Solve the equation. Check your solution(s): $-3|x+1|-6=-24$

6. Which transformations describe the equation from its parent equation? $f(x-9)+2$

7. The first term of an arithmetic sequence is equal to 6 and the common difference is equal to 3. Find the explicit formula for the sequence and find the value of the 50th term.
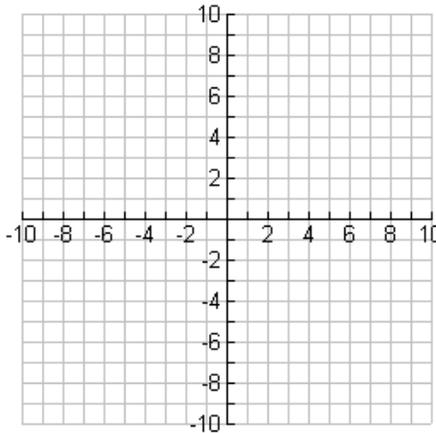
Problems:
Be sure to **show all work used to obtain your answer. Circle or box in the final answer.**

8. Solve the linear system using the **substitution method:** $\begin{array}{l} -2y-x=-3 \\ -7x+3y=-21 \end{array}$
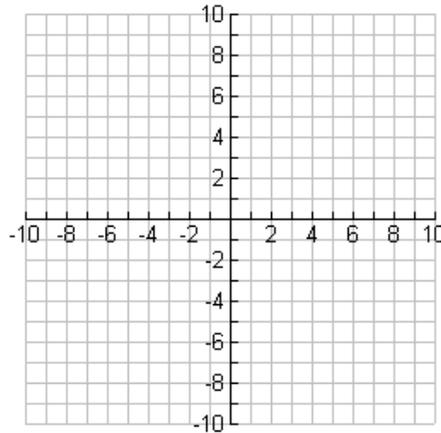
9. Graph the following linear systems and solve:

a.
$$2x + y = 9$$
$$-3x + y = -1$$

b.
$$x - 2y = 6$$
$$-2x + 4y = -20$$

10. Solve the linear system using the linear combinations (**elimination**) method:
$$4x + 3y = -1$$
$$5x + 4y = 1$$

11. Solve the linear systems (any method) and state how many solutions the system has. Then, tell whether the lines are intersecting, parallel, or coincident.

a.
$$3x - 4y = -5$$
$$5x - 2y = -6$$

b.
$$y = -2x + 4$$
$$-4x - 2y = -8$$

Number of Solutions: _____　　　　　Number of Solutions: _____

Type of Lines: _____　　　　　Type of Lines: _____

c.
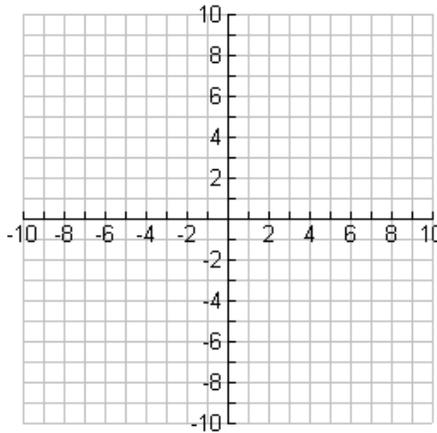$$2v = 150 - u$$
$$2u = 150 - v$$

Number of Solutions: _____

Type of Lines: _____
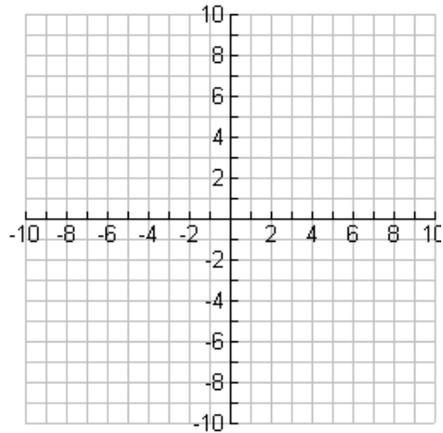
12. Graph the system of inequalities:

a. $x + y < 3$
$2x - y \geq 5$

b. $3x + y \leq 5$
$y \geq 2x - 2$

13. A store sells two brands of CD players. To meet customer demand, it is necessary to stock at least twice as many CD players of brand A as of brand B. It is also necessary to have at least 10 of brand B available. In the store there is room for no more than 50 players. Write a system of inequalities to describe the ways to stock the two brands.

14. The area of a parking lot is 600 square meters. A car requires 6 square meters. A bus requires 30 square meters. The attendant can handle only 60 vehicles. If a car is charged $2.50 and a bus $7.50, how many of each should be accepted to maximize income?

a. Write the objective function below.

b. The constraints have been graph at the right.
   Using the graph, determine the maximum income.
   Show work below.
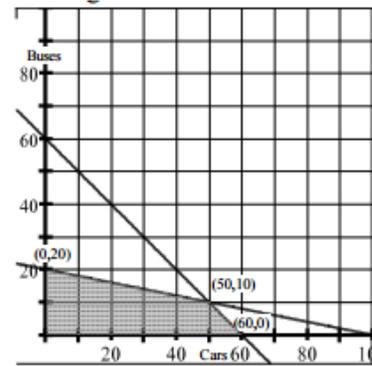
15. A cross-trainer wants to burn 380 Calories during 40 minutes of exercise. He burns about 8 Calories per minute inline skating and 12 Calories per minute swimming. How long should he spend doing each activity?

Multiple Choice Section: **Circle the best answer.**

16. What is the *y*-coordinate of the point of intersection for the two lines below?

$$-6x + 7y = 20$$
$$2x - 3y = 4$$

   A. −22   B. −16   C. 16   D. 22

17. How many solutions does the system of equations have?

$$-2x + 4y = 1$$
$$3x - 6y = 9$$

   A. no solution
   B. one solution
   C. two solutions
   D. infinitely many solutions

18. Which ordered pair is in the solution set for the system of inequalities shown below?

$$2x - y < 3$$
$$x + 2y > -1$$

   A. $(-2, -1)$
   B. $(0, 1)$
   C. $(1, -2)$
   D. $(6, 1)$

19. Yolanda has 30 coins worth $2.35. She has only nickels and dimes. How many dimes does Yolanda have?

   A. 15
   B. 17
   C. 19
   D. 23

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CALCULATOR SECTION

20. A ballet company says that 540 tickets have been sold for its upcoming performance. Tickets for the Orchestra seats are $56. Tickets for the Balcony seats are $38. The company has sold $24,120 in tickets. How many Orchestra and Balcony seats were sold?

21. Solve the linear system using your graphing calculator:
$$3x + 4.02y = -9$$
$$y = 3.1x + 30.8$$

22. A farmer can plant up to 8 acres of land with wheat and barley. He can earn $5,000 for every acre he plants with wheat and $3,000 for every acre he plants with barley. His use of a necessary pesticide is limited by federal regulations to 10 gallons for his entire 8 acres. Wheat requires 2 gallons of pesticide for every acre planted and barley requires just 1 gallon per acre? What is the maximum profit he can make?

a. Identify your variables

b. Find the objective function to maximize profit.

c. Write the constraints and graph (use technology or graph provided).
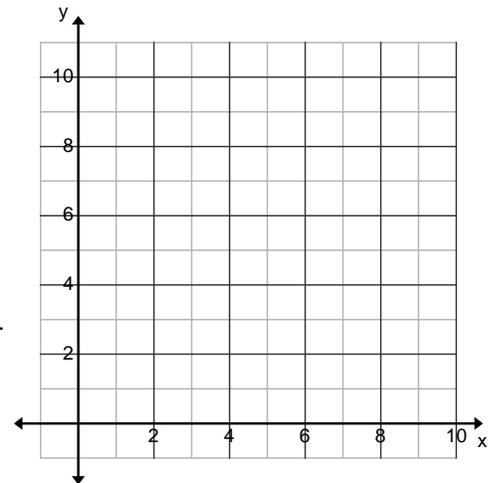
d. List the vertices:

e. Find the maximum profit.