

Name: _____ Date: _____ Period: _____

Algebra 1
Chapter 6 Study Guide

1. Solve the system by graphing. Tell whether the system has one solution, infinitely many solutions, or no solution. Classify this system as consistent, inconsistent, dependent, etc.

$$\begin{aligned}x - 2y &= 3 \\ y &= -2x + 6\end{aligned}$$

2. Solve using either elimination or substitution. You MUST use both methods at least once. You should also make an effort to determine which method is best in each problem.

a) $\begin{aligned}x + 2y &= -1 \\ 2x - 3y &= 12\end{aligned}$ b) $\begin{aligned}-2x + 3y &= 9 \\ 2x - 2y &= -4\end{aligned}$ c) $\begin{aligned}3x - 7y + 10 &= 0 \\ y - 2x - 3 &= 0\end{aligned}$ d) $\begin{aligned}x + \frac{y}{2} &= 4 \\ \frac{x}{3} + 2y &= 5\end{aligned}$

3. How can you test if (3, -5) is a solution to the inequality $2x - 3y = -12$?
4. Write a system of equations to model the following two situations. Be sure to define two variables for each problem. Write two equations for each problem. Solve using any method.
- a) The ratio of incomes of two people is 9:7. The difference in their weekly incomes is \$200. What are their weekly incomes?
- b) A change purse contains a total of 100 quarters and dimes. The total value of the coins is \$17.50. How many coins of each type does the purse contain?
5. Graph the following inequalities or systems of inequalities on a coordinate plane.

a) $-3x + 2y < 5$

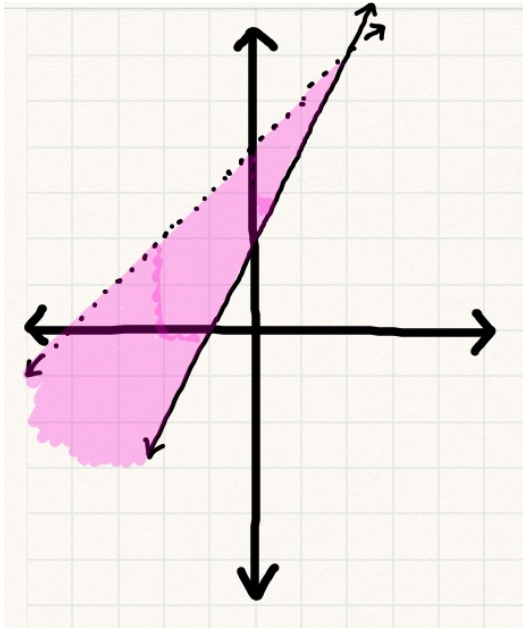
b) $y \geq 2x - 4$

c) $\begin{aligned}2x + 3y &\leq 6 \\ 3x + 2y &< 6\end{aligned}$

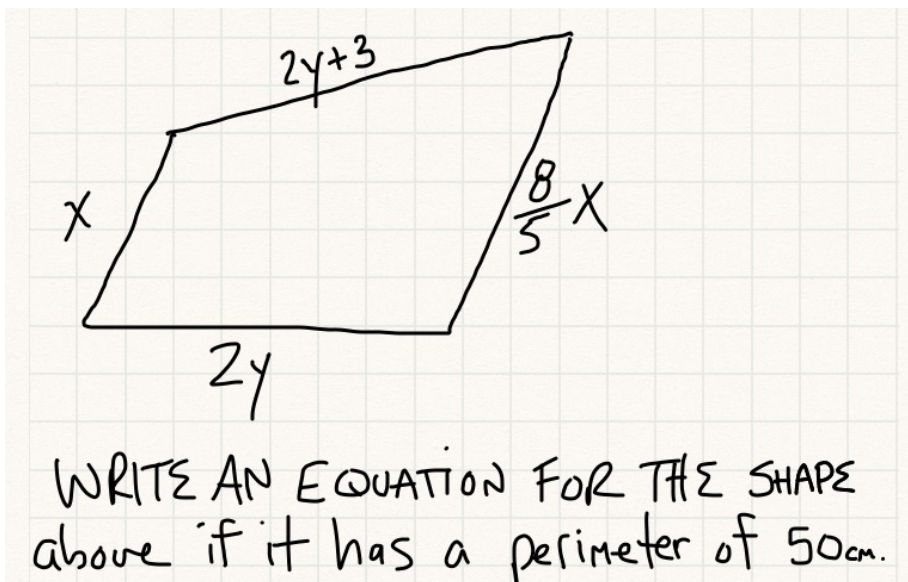
d) $\begin{aligned}y &< -\frac{1}{2}x \\ y &\geq -2\end{aligned}$

6. For a party you have a maximum budget of \$50. Pizza is \$6.00 per pie and soda is \$1 for a 2-liter container. Define two variables, write an inequality and graph the inequality to show what combination of pizza and soda could be purchased.

7. In the previous question, name three different combinations of pizza and soda that would cost less than \$50.
8. Write a system of linear equations that has infinitely many solutions.
9. Write a system of inequalities that has no solution.
10. Write a system of inequalities that matches the graph below.



11.



12. Suppose you win a fashion make-over and are given a \$300 gift certificate to The Gap to purchase new t-shirts (\$15 each) and dress shirts (\$45 each). You are required to spend at least 90% of the gift certificate but you don't want to spend more than the gift certificate either. The only fashion rule you must follow is that your number of dress shirts be at least twice the number of t-shirts.

A) Write a system of linear inequalities that illustrates this situation. Be sure to consider all 3 requirements.

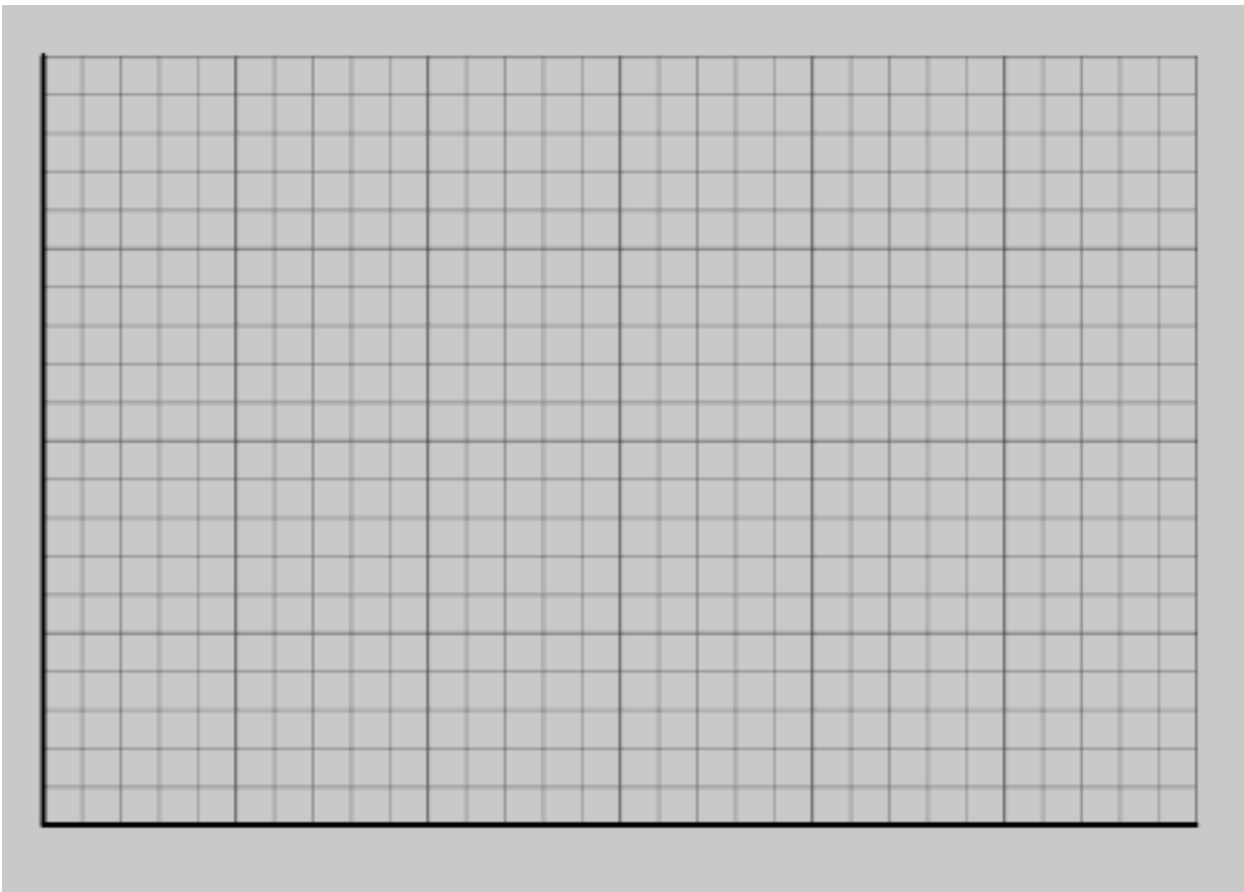
minimum spending

maximum spending

fashion rule

B) What is a graph showing how many of each type of shirt you can purchase? Be sure to shade on the graph provided below.

C) What is 1 possible t-shirt/dress-shirt combination that you could have?



Extra practice:

Multiple Choice. Write your answer on the line provided.

_____13 Which of the following is true about the given system? $2x - 4y = 18$
 $x = 2y$

- a) The system has zero solutions
- b) The system has exactly one solution
- c) The system has two solutions
- d) The system has infinitely many solutions

_____14. Which system has no solution?

- | | |
|--------------------|--------------------|
| $2x - y = 10$ | $3x - 3 = 18y$ |
| A) $x + 4y = 12$ | B) $36y = 6x - 12$ |
| C) $10x - 5y = 15$ | D) $x + 2y = 1$ |
| $2y = 4x - 6$ | $-x + 3y = 1$ |

_____15. Which ordered pair of numbers is the solution to the system? $4x - 6y = 12$
 $y = -\frac{1}{6}x + 3$

- A) (2,3) B) (6,2) C) (1,-2) D) (-3,6)

True or False. Write T for true and F for false on the line provided.

_____16. When solving a system of inequalities, the goal is simply to find only the exact point where the two boundary lines cross

_____17. The system of equations will always have infinite answers if the two lines have the same slope.

Solve each system of equation using any method.

18. $3x + 2y = 41$
 $5x - 3y = 24$

19. $y = -x + 4$
 $3x - y = -12$

20. Jay has written 24 songs to date. He writes an average of 6 songs per year. Jenna started writing songs this year and expects to write about 12 songs per year.

- a. Write an equation for the total number of songs at the end of an unknown (think variable) number of years
- b. Define your variables
- c. Solve using any method
- d. How many years from now will Jenna have written as many songs as Jay?

21. A farmer plans to create a rectangular garden that he will enclose with chicken wire. The garden can be no more than 30 feet wide. The farmer would like to use at most 180 feet of chicken wire.

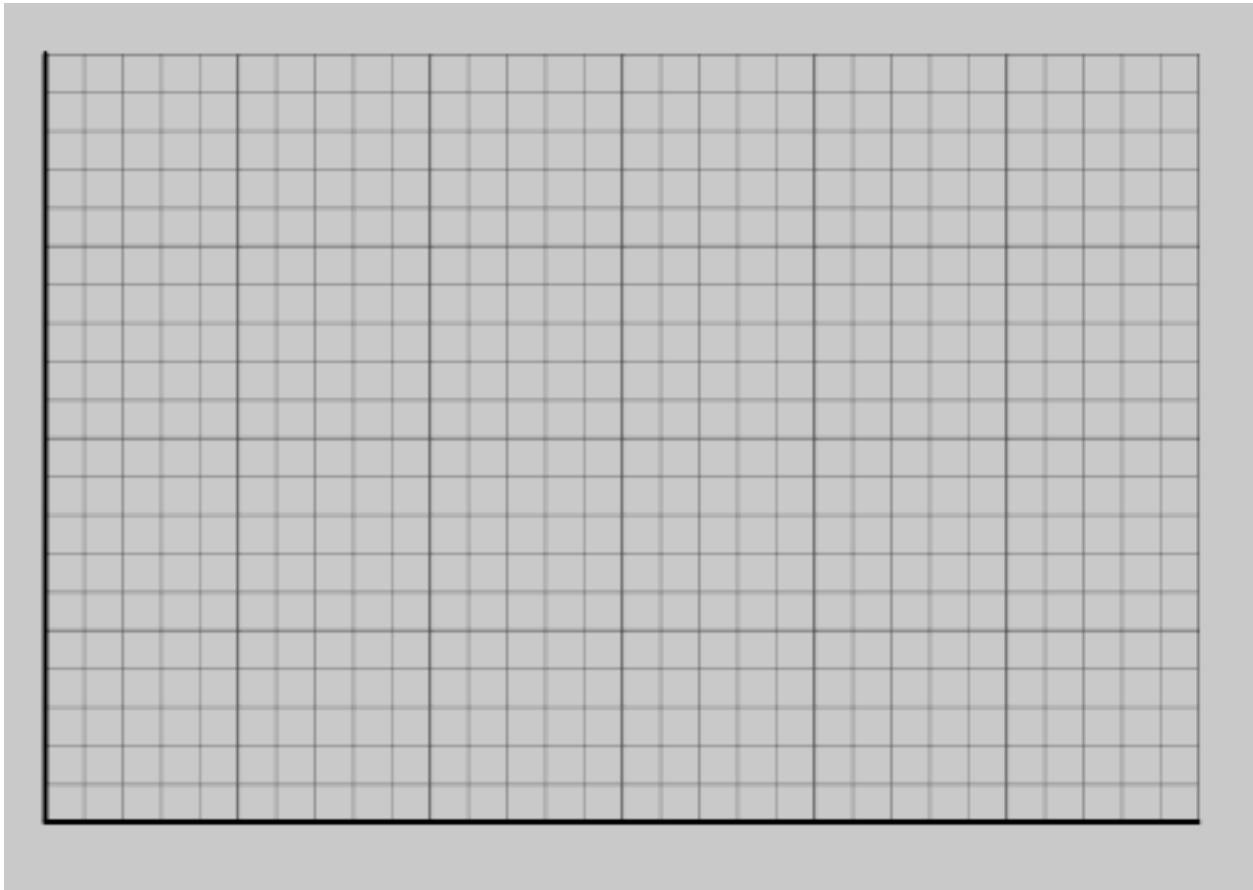
Use x = length and y = width for your inequalities and your graph.

- A) Write a system of linear inequalities that illustrates this situation. Be sure to consider both requirements.

- B) What is a graph showing the length vs width combinations that are acceptable?
Be sure to shade on the graph provided below. Scale and label the axes to suit your needs.

- C) From your shaded graph, name three possible (length, width) combinations that the farmer **could** use.

- D) From your graph, name two (length, width) combinations that the farmer **cannot** use.



22. Look at the following image and the information about their perimeters.



The perimeter of both of the rectangles above are 16 units each.

a) Write a pair of equations for the perimeter of the left and right rectangles.

b) Solve your system using any technique you like.

c) Use your (x, y) answer to find the dimensions of the left rectangle.

23. When graphing inequalities, when do you use a dotted line and when do you use a solid line?

24. For these last 3 graphs, write the system of inequalities that is shown in the image **under the image**.

