Name: Key

Systems of Linear Equations: Story Problems

Solve each of the following problems by graphing.

1. A four-foot-long wooden rod is cut into two piece to make a kite. One piece is three times as long as the other. Let x = the length of the longer piece and let y = the length of the shorter piece.

   a. Write a system of equations to find the length of each piece.

   $x + y = 4 \rightarrow y = -x + 4$

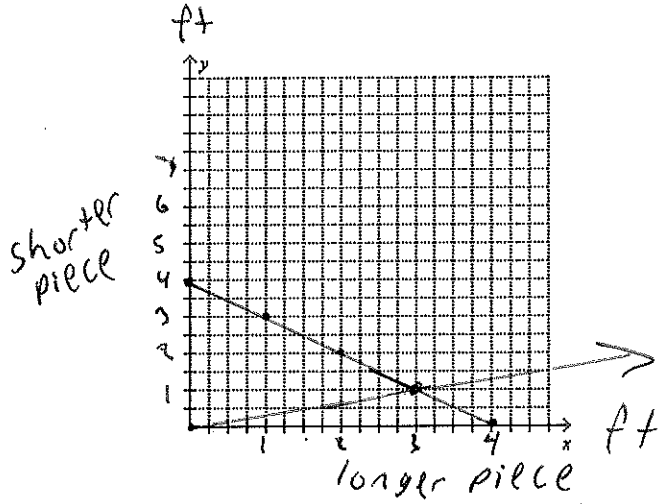
   $x = 3y \rightarrow y = \frac{1}{3}x$

   b. Solve the system by graphing. State the length of each piece.

Answer (3, 1)

$x = 3$ ft

$y = 1$ ft



2. The difference of two numbers is 5. The result when the greater number is decreased by twice the lesser is 9. Let x = the greater number and let y = the lesser number.

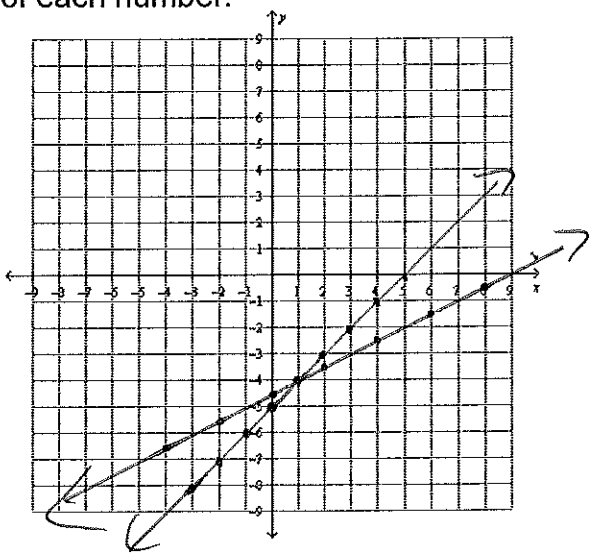
   a. Write a system of equations to find each number.

   $x - y = 5 \rightarrow y = x + -5$

   $x - 2y = 9 \rightarrow y =$

   b. Solve the system by graphing. What is the value of each number.

Answer (1, -4)



3. There are 11 animals in a barnyard, Some are chickens and some are cows. There are 38 legs in all. Let x = the number of chickens and let y = the number of cows. How many of each animal are in the barnyard?

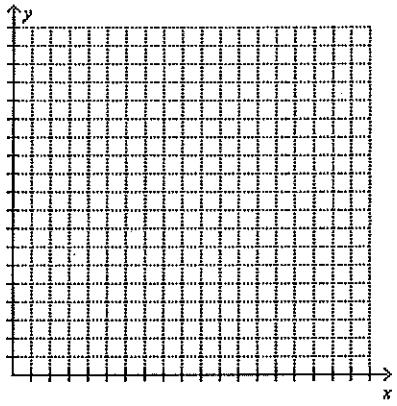
$x + y = 11 \xrightarrow{m(-2)} -2x + -2y = -22$

$2x + 4y = 38 \longrightarrow 2x + 4y = 38$

$2y = 16$

$y = 8$

Answer (3, 8)



3 → chickens

8 → cows

4. Ted and Jason are going to race their dirt bikes. Since Ted is younger, Jason is going to give him a 10 mile head start. Ted travels at 10 mph and Jason travels at 20 mph.

a. Prepare a graph representing the boys race. (Hint: To decide which variable to put on which axis, think about what the independent variable and the dependent variable.

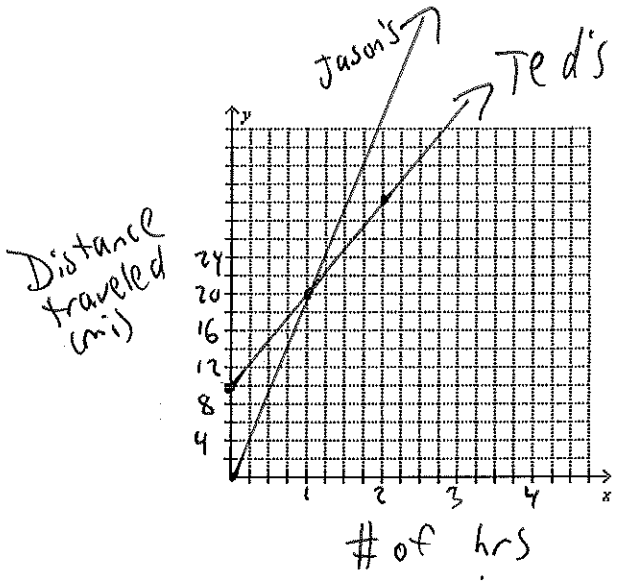
X = # of hrs

Y = # of mi traveled

Ted's → $y = 10x + 10$

Jason's → $y = 20x$

Answer: (1, 20)



b. Write the equation for each boy.

Ted: $y = 10x + 10$ Jason: $y = 20x$

c. At what time will Jason catch up with Ted?

After 1hr of racing.

d. How far will they have traveled when they met?

They both will have 20 miles of distance traveled.