

## Warm-Up

Use the **substitution method** to solve the following system of equations:

$$2x + y = 11$$

$$y = 4x + 17$$

$$(-1, 13)$$

$$2x + (4x + 17) = 11$$

$$6x + 17 = 11$$

$$6x = -6$$

$$x = -1$$

$$y = 4x + 17$$

$$y = 4(-1) + 17$$

$$y = -4 + 17$$

$$y = 13$$

## QUESTIONS FROM HOMEWORK

$$\textcircled{5} \begin{array}{l} \div 10 \\ \div 8 \end{array} \begin{array}{l} -80x - 60y = -20 \\ -64x - 48y = -16 \end{array}$$

$$\begin{array}{r} -8x - 6y = -2 \\ \Leftrightarrow \frac{-8x - 6y = -2}{-8x - 6y = -2} \\ \hline 0 = 0 \end{array}$$

Infinite # of Solutions

$$\textcircled{11} -y = 3 + 2x$$

$$\begin{array}{l} y = -3 - 2x \\ \boxed{y = -2x - 3} \end{array}$$

$$\begin{array}{l} m = -2 \\ b = -3 \end{array}$$

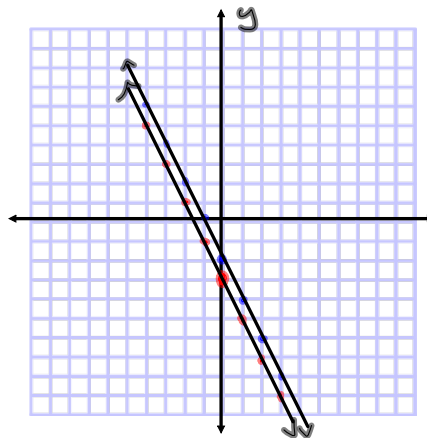
$$\textcircled{x} + \frac{1}{2}y = -1$$

$$\begin{array}{l} \cdot 2 \\ \frac{1}{2}y = -x - 1 \\ \boxed{y = -2x - 2} \end{array}$$

$$\begin{array}{l} m = -2 \\ b = -2 \end{array}$$

Since the lines have the same slope we know they are parallel and therefore will not intersect.

No Solution



# Solving Word Problems

# Applications

Step 1: Read the problem (multiple times!)

Step 2: Define the two variables in the problem

Step 3: Set up the equations from the problem  
(# equations = # unknowns)

Step 4: Solve the system of equations

Step 5: State your conclusion

A landscaping company placed two orders with a nursery. The first order was for 13 shrubs 4 trees and totaled \$487. The second order was for 6 shrubs and 2 trees and it totaled \$232. Determine the cost of each.

Let  $x =$  shrub (\$)

Let  $y =$  tree (\$)

$$13x + 4y = 487$$

$$(2) \quad 6x + 2y = 232$$

$$13x + 4y = 487$$

$$\Leftrightarrow \frac{12x + 4y = 464}{\phantom{12x + 4y = 464}}$$

$$x = 23$$

$$6(23) + 2y = 232$$

$$138 + 2y = 232$$

$$2y = 94$$

$\therefore$  A shrub costs \$23 and a tree will set you back \$47.



The admission to the fair is \$2 for children and \$4 for adults. On Saturday one thousand people attended and \$2800 was collected. How many children and how many adults attended the fair?

Let  $x = \#$  of children

Let  $y = \#$  of adults

$$2x + 4y = 2800$$

$$x + y = 1000$$



$$\begin{array}{r} 2x + 4y = 2800 \\ (-) \quad 2x + 2y = 2000 \\ \hline 2y = 800 \\ \boxed{y = 400} \end{array}$$

$$\begin{array}{r} x + y = 1000 \\ x + 400 = 1000 \\ \boxed{x = 600} \end{array}$$

$\therefore$  600 children + 400 adults attended.

A pizza costs \$10 more than a donair. If two pizzas and three donairs cost \$40, find the cost of each item.

Let  $x = \text{pizza } (\$)$   
Let  $y = \text{donair } (\$)$

$$2x + 3y = 40$$

$$x = y + 10$$



$$2(y+10) + 3y = 40$$

$$2y + 20 + 3y = 40$$

$$5y = 20$$

$$y = 4$$

$$x = y + 10$$

$$x = 4 + 10$$

$$x = 14$$

A total of \$12,000 is invested in two funds paying 9% and 11% simple interest. If the yearly interest is \$1,180, how much of the \$12,000 is invested at each rate?

Let  $x$  = investment @ 9%  
 Let  $y$  = " @ 11%



$$x + y = 12000$$

$$0.09x + 0.11y = 1180$$

$$\begin{array}{r} 9x + 9y = 108000 \\ (-) \quad 9x + 11y = 118000 \\ \hline -2y = -10000 \\ y = \$5000 \end{array}$$

$$\begin{array}{r} x + y = 12000 \\ x + 5000 = 12000 \\ \hline x = \$7000 \end{array}$$

$\therefore$  \$5000 is invested @ 11%  
 \$7000 " " @ 9%



# Homework