

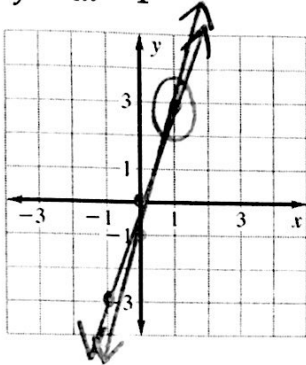
Review Lessons 3.1 & 3.2 Worksheet

Name: KEY

Solve the linear system by graphing (show me how you graphed). Remember, you must check your solution algebraically. Then classify the system as *consistent and independent*, *consistent and dependent*, or *inconsistent*.

1.) $y = 3x$

$y = 4x - 1$



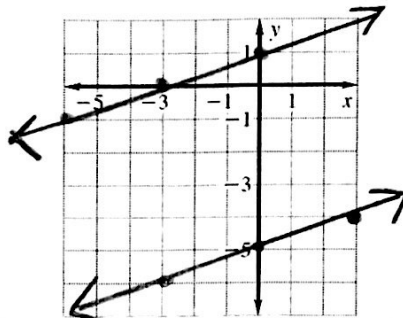
solution: (1, 3)

classify: consistent, independent

check: $3 = 3(1)$ $3 = 4(1) - 1$
 $3 = 3$ $3 = 3$

2.) $-2x + 6y = 6$

$3y + 15 = x$



$-2x + 6y = 6$
 $6y = 2x + 6$
 $y = \frac{1}{3}x + 1$

$3y + 15 = x$
 $3y = x - 15$
 $y = \frac{1}{3}x - 5$

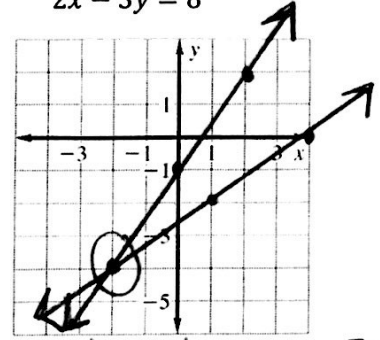
solution: NO SOLUTION

classify: inconsistent

check:

3.) $-9x + 6y = -6$

$2x - 3y = 8$



solution: (-2, -4)

classify: consistent, independent

check: $-9(-2) + 6(-4) = -6$ $2(-2) - 3(-4) = 8$
 $18 - 24 = -6$ $-4 + 12 = 8$
 $-6 = -6$ $8 = 8$

4.) A business rents in-line skates for \$15 and bicycles for \$30. During one day, the business has a total of 25 rentals and collects \$450 for the rentals. Find the number of pairs of skates rented and the number of bicycles rented.

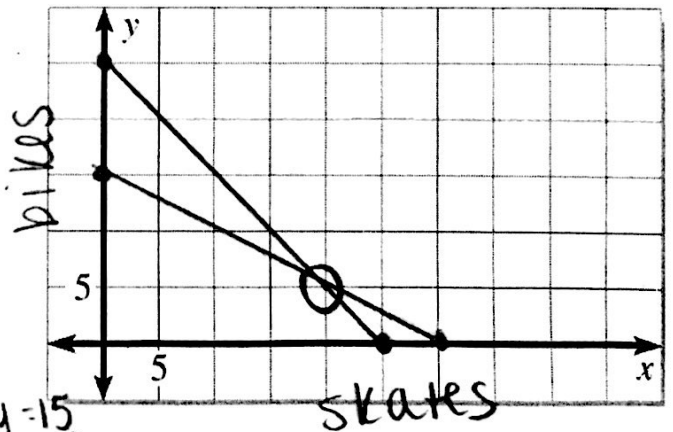
a.) Write a linear system that represents the situation. Let x be the number of pairs of skates rented, and let y be the number of bicycles rented.

$$\begin{aligned} x + y &= 25 \\ 15x + 30y &= 450 \end{aligned}$$

b.) Graph both equations to find your solution.

Show what you used to graph. Notice the scale.

$x + y = 25$ $15x + 30y = 450$
 x -int: $(25, 0)$ x -int: $15x = 450$
 y -int: $(0, 25)$ y -int: $30y = 450$



c.) How many in-line skates and bikes were rented on this particular day? Check your answer.

(20, 5)

20 skates & 5 bikes

$20 + 5 = 25$ $15(20) + 30(5) = 450$
 $25 = 25$ $300 + 150 = 450$
 $450 = 450$

Solve the linear system using substitution.

$$\begin{aligned} 6.) \quad & 4x + 3y = 0 \\ & 2x + y = -2 \\ & y = -2 - 2x \end{aligned}$$

$$\begin{aligned} 4x + 3(-2 - 2x) &= 0 \\ 4x - 6 - 6x &= 0 \\ -6 - 2x &= 0 \\ -2x &= 6 \\ x &= -3 \end{aligned}$$

$$\begin{aligned} y &= -2 - 2(-3) \\ y &= -2 + 6 \\ y &= 4 \end{aligned}$$

$(-3, 4)$

$$\begin{aligned} 8.) \quad & -3x - 4y = 4 \\ & 3x + 3y = -3 \\ & 3x = -3 - 3y \\ & x = -1 - y \end{aligned}$$

$$\begin{aligned} -3(-1 - y) - 4y &= 4 \\ 3 + 3y - 4y &= 4 \\ 3 - y &= 4 \\ -y &= 1 \\ y &= -1 \end{aligned}$$

$$\begin{aligned} x &= -1 - (-1) \\ x &= -1 + 1 \\ x &= 0 \end{aligned}$$

$(0, -1)$

Solve the linear system using elimination.

$$\begin{aligned} 10.) \quad & 5x + 2y = 43 \\ & -6x + 3y = -30 \end{aligned}$$

$$\begin{aligned} + \quad & -15x - 6y = -129 \\ & -12x + 6y = -60 \\ \hline & -27x = -189 \\ & x = 7 \end{aligned}$$

$$\begin{aligned} 5(7) + 2y &= 43 \\ 35 + 2y &= 43 \\ 2y &= 8 \\ y &= 4 \end{aligned}$$

$(7, 4)$

$$\begin{aligned} 12.) \quad & -3x - y = 8 \\ & 7x + 12 = -y \\ & 7x + y = -12 \\ + \quad & -3x + y = 8 \end{aligned}$$

$$\begin{aligned} 4x &= -4 \\ x &= -1 \end{aligned}$$

$$\begin{aligned} -3(-1) - y &= 8 \\ 3 - y &= 8 \\ -y &= 5 \\ y &= -5 \end{aligned}$$

$(-1, -5)$

$$\begin{aligned} 7.) \quad & -x + 3y = -9 \\ & 8x - 4y = 32 \end{aligned}$$

$$8(9 + 3y) - 4y = 32$$

$$72 + 24y - 4y = 32$$

$$72 + 20y = 32$$

$$20y = -40$$

$$y = -2$$

$$\begin{aligned} 9.) \quad & -2x + 6y = 6 \\ & -7x + 8y = -5 \end{aligned}$$

$$-2x + 6y = 6$$

$$-2x = 6 - 6y$$

$$x = -3 + 3y$$

$$-7(-3 + 3y) + 8y = -5$$

$$21 - 21y + 8y = -5$$

$$21 - 13y = -5$$

$$-13y = -26$$

$$y = 2$$

$$\begin{aligned} + \quad & 27x + 18y = 45 \\ & 10x - 18y = -8 \end{aligned}$$

$$37x = 37$$

$$x = 1$$

$(1, 1)$

$$13.) \quad 11x - 20y = 28$$

$$5(3x + 4y = 36)$$

$$15x + 20y = 180$$

$$+ \quad 11x - 20y = 28$$

$$26x = 208$$

$$x = 8$$

$(8, 3)$

$$11(8) - 20y = 28$$

$$88 - 20y = 28$$

$$-20y = -60$$

$$y = 3$$

14.) A drummer is stocking up on drum sticks and brushes. The wood sticks that he buys are \$10.50 a pair and the brushes are \$24 a pair. He ends up spending \$90 on sticks and brushes and buys two times as many pairs of sticks as brushes.

a.) Define variables for the unknowns. Write a system of equations that models the situation.

$$\begin{aligned} 10.50x + 24y &= 90 \\ x &= 2y \end{aligned}$$

$x = \#$ of pairs of sticks
 $y = \#$ of pairs of brushes

b.) Solve your system of equations using the method of your choice.

$$\begin{aligned} 10.50(2y) + 24y &= 90 \\ 21y + 24y &= 90 \\ 45y &= 90 \\ y &= 2 \end{aligned}$$

$$\begin{aligned} x &= 2y \\ x &= 2(2) \\ x &= 4 \end{aligned}$$

c.) How many pairs of sticks and brushes did he buy?

4 pairs of sticks
 2 pairs of brushes

15.) Two cars get an oil change at the same service center. Each customer is charged a fee x (in dollars) for the oil change plus y dollars per quart of oil used. The oil change for the car that requires 5 quarts of oil costs \$22.45. The oil change for the car that requires 7 quarts of oil costs \$25.45.

a.) Define variables for the unknowns. Write a system of equations that models the situation.

$$\begin{aligned} 1: \quad x + 5y &= 22.45 \\ 2: \quad x + 7y &= 25.45 \end{aligned}$$

$x =$ oil change fee
 $y =$ cost per quart of oil

b.) Solve your system of equations using the method of your choice.

$$\begin{aligned} x + 5y &= 22.45 \\ -1(x + 7y) &= -25.45 \\ \hline -x - 7y &= -25.45 \\ x + 5y &= 22.45 \\ \hline -2y &= -3 \\ y &= 1.50 \end{aligned}$$

$$\begin{aligned} x + 5y &= 22.45 \\ x + 5(1.50) &= 22.45 \\ x + 7.50 &= 22.45 \\ x &= 14.95 \end{aligned}$$

c.) Find the fee and the cost per quart of oil.

\$14.95 oil change fee
 \$1.50 per quart of oil

16.) During a football game, the parents of the football players sell pretzels and popcorn to raise money for new uniforms. They charge \$2.50 for a bag of popcorn and \$2 for a pretzel. The parents collect \$336 in sales during the game. They sell twice as many bags of popcorn as pretzels. How many bags of popcorn do they sell? How many pretzels do they sell?

a.) Define variables for the unknowns. Write a system of equations that models the situation.

$$\begin{cases} 2.50x + 2y = 336 \\ x = 2y \end{cases}$$

x = bags of popcorn
 y = # of pretzels

b.) Solve your system of equations using the method of your choice.

$$2.50(2y) + 2y = 336$$

$$5y + 2y = 336$$

$$7y = 336$$

$$y = 48$$

$$x = 2y$$

$$x = 2(48)$$

$$x = 96$$

c.) How many bags of popcorn do they sell? How many pretzels do they sell?

96 bags of popcorn
48 pretzels