

# Lesson 3.1 Worksheet

Name: Key

Tell whether the ordered pair is a solution to the system of linear equations. You must have work to back up your answer.

1.)  $(-3, 1)$

2.)  $(5, 2)$

3.)  $(-2, 1)$

$$\begin{aligned} x + y &= -2 \\ x + 5y &= 2 \end{aligned}$$

$$\left. \begin{aligned} -3 + 1 &= -2 \\ -2 &= -2 \checkmark \end{aligned} \right\} \begin{aligned} -3 + 5(1) &= 2 \\ -3 + 5 &= 2 \\ 2 &= 2 \checkmark \end{aligned}$$

$$\begin{aligned} 2x - 3y &= 4 \\ 2x + 8y &= 11 \end{aligned}$$

$$\left. \begin{aligned} 2(5) - 3(2) &= 4 \\ 10 - 6 &= 4 \\ 4 &= 4 \checkmark \end{aligned} \right\} \begin{aligned} 2(5) + 8(2) &= 11 \\ 10 + 16 &= 11 \\ 26 &\neq 11 \times \end{aligned}$$

$$\begin{aligned} 6x + 5y &= -7 \\ x - 2y &= 0 \end{aligned}$$

$$\left. \begin{aligned} 6(-2) + 5(1) &= -7 \\ -12 + 5 &= -7 \\ -7 &= -7 \checkmark \end{aligned} \right\} \begin{aligned} -2 - 2(1) &= 0 \\ -2 - 2 &= 0 \\ -4 &\neq 0 \times \end{aligned}$$

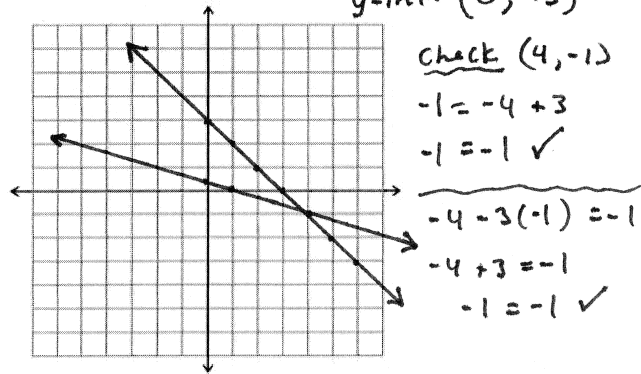
solution? yes

solution? no

solution? no

Solve the linear system by graphing (be sure that it is clear to me how you graphed your lines). You must check your solution algebraically. Then classify the system as *consistent and independent*, *consistent and dependent*, or *inconsistent*.

4.)  $y = -x + 3 \rightarrow m = -1, y\text{-int: } (0, 3)$   
 $-x - 3y = -1 \rightarrow x\text{-int: } (1, 0)$   
 $y\text{-int: } (0, 1/3)$



check  $(4, -1)$   
 $-1 = -4 + 3$   
 $-1 = -1 \checkmark$

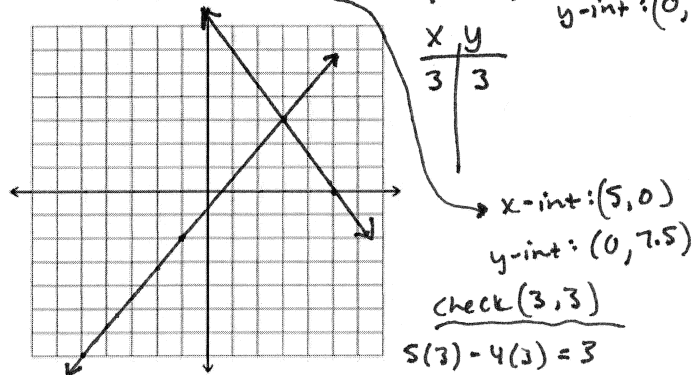
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 $-4 - 3(-1) = -1$   
 $-4 + 3 = -1$   
 $-1 = -1 \checkmark$

solution:  $(4, -1)$

classify: consistent, independent

6.)  $5x - 4y = 3 \rightarrow -4y = -5x + 3$   
 $3x + 2y = 15 \rightarrow y = \frac{5}{4}x - \frac{3}{4} \quad m = \frac{5}{4}$   
 $y\text{-int: } (0, -3/4)$



| x | y |
|---|---|
| 3 | 3 |

$x\text{-int: } (5, 0)$   
 $y\text{-int: } (0, 7.5)$

check  $(3, 3)$   
 $5(3) - 4(3) = 3$   
 $15 - 12 = 3$   
 $3 = 3 \checkmark$

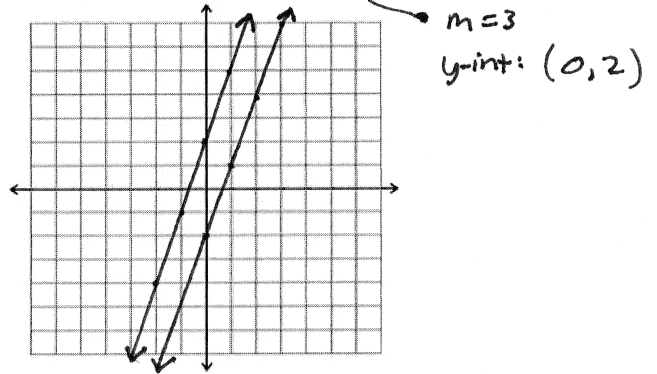
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 $3(3) + 2(3) = 15$   
 $9 + 6 = 15$   
 $15 = 15 \checkmark$

solution:  $(3, 3)$

classify: consistent independent

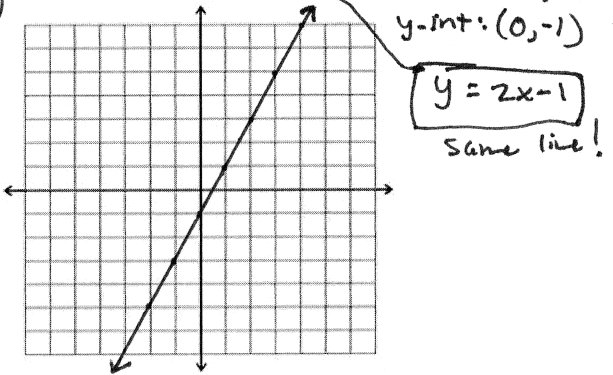
5.)  $-6x + 2y = -4 \rightarrow 2y = 6x - 4 \quad m = 3$   
 $y = 3x + 2 \quad y\text{-int: } (0, -2)$



solution: NO SOLUTION

classify: inconsistent

7.)  $y = 2x - 1 \rightarrow m = 2, y\text{-int: } (0, -1)$   
 $-6x + 3y = -3 \rightarrow x\text{-int: } (1/2, 0)$   
 $y\text{-int: } (0, -1)$

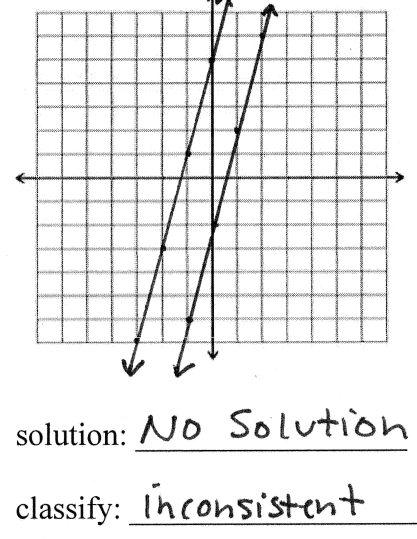
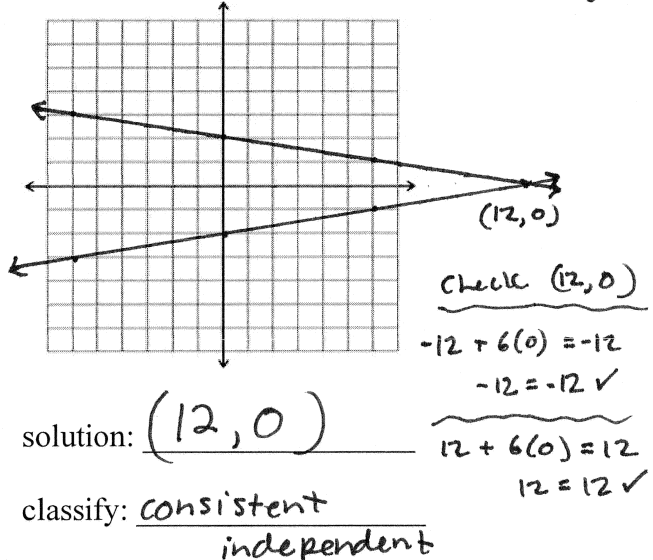


solution: Infinitely many solutions

classify: consistent, dependent

8.)  $-x + 6y = -12$   
 $x + 6y = 12 \rightarrow y = -\frac{1}{6}x + 2$   $m = \frac{1}{6}$   
 $y\text{-int: } (0, 2)$

9.)  $-4x + y = 5$   
 $-2y = -8x + 4 \rightarrow y = 4x - 2$   
 $m = 4, y\text{-int: } (0, -2)$

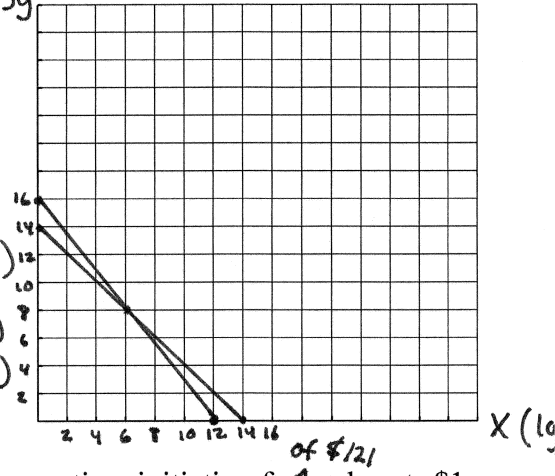


10.) You worked 14 hours last week and earned a total of \$96. Your job as a lifeguard pays \$8 per hour, and your job as a cashier pays \$6 per hour. How many hours did you work at each job?

- a. Write a system of equations that models your work and pay for last week. (Hint: one equation should model the total hours you worked, and one equation should model your pay). Be sure to define your variables.  $x = \text{hours worked at lifeguard}$  ( $x$ )  $y = \text{hours worked at cashier}$  ( $y$ )

$$\begin{aligned} x + y &= 14 \\ 8x + 6y &= 96 \end{aligned}$$

- b. Solve your system of equations by graphing. Be sure to label your axes.



- c. How many hours did you work at each job?

$(6, 8)$   $6 + 8 = 14$   $8(6) + 6(8) = 96$   
 $14 = 14 \checkmark$   $96 = 96 \checkmark$

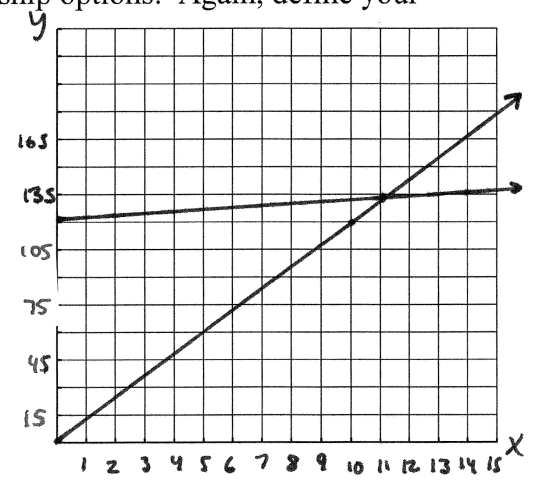
6 hours as lifeguard  
8 hours as cashier

11.) A gym offers two options for membership plans. Option A includes a one-time initiation fee and costs \$1 per day. Option B has no initiation fee but costs \$12 per day.

- a. Write a system of equations that models the two gym membership options. Again, define your variables.

$y = \text{total cost}$   $A: y = x + 121$   
 $x = \text{days of operation}$   $B: y = 12x$

- b. Solve your system of equations by graphing. Be sure to label your axes.  $(11, 132)$



- c. After how many days will the total costs of the gym membership plans be equal?  
 $132 = 11 + 121$   $132 = 12(11)$   
 $132 = 132 \checkmark$   $132 = 132 \checkmark$   
 After 11 days, the cost will be the same.