

Warm-up 11/29

Solve the following systems of equations

1. $x = 2$
 $y = 6x - 11$

2. $2x - 3y = -1$
 $y = 2x - 2$



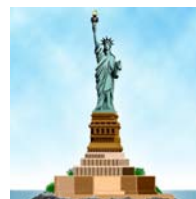
Complete the Tuesday and Wednesday reflection for Growth Mindset Week 1.

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Solve the following systems of equations



1. $x = 2$
 $y = 6x - 11$

$$y = 6(2) - 11$$

$$y = 12 - 11$$

$$y = 1$$

$$(2, 1)$$

2. $2x - 3y = -1$

$$y = 2x - 2$$

$$2x - 3(2x - 2) = -1$$

$$2x - 6x + 6 = -1$$

$$-4x + 6 = -1$$

$$-4x = -7$$

$$\frac{-4}{-4} x = \frac{-7}{-4} \quad x = \frac{7}{4}, 1.75$$

$$y = 2(1.75) - 2$$

$$y = 3.5 - 2$$

$$y = 1.5$$

$$(1.75, 1.5)$$

$$2x - 3y = -1$$

$$-2x \quad -2x$$

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

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

Today's Goal

I can...

- **solve a system of equations by using the Elimination.**

$$-3x - 3y = 18$$

$$2x + 3y = -2$$

$$\frac{-1x}{-1} = \frac{16}{-1}$$

$$x = -16$$

$$(-16, 10)$$

$$2(-16) + 3y = -2$$

$$\frac{-32 + 3y = -2}{+32 \quad +32}$$

$$\frac{3y}{3} = \frac{30}{3}$$

$$y = 10$$

Section 5.3 ~ Solving Systems by Elimination

The process of adding two equations together in such a way as to "eliminate" one variable in order to solve for the other



Example:

$$\begin{array}{r} 5x - 2y = -15 \\ 3x + 2y = 39 \\ \hline 8x = 24 \\ \frac{8x}{8} = \frac{24}{8} \\ x = 3 \end{array}$$

$$\begin{array}{r} 5(3) - 2y = -15 \\ 15 - 2y = -15 \\ \frac{15 - 2y}{-2} = \frac{-15}{-2} \\ -2y = -30 \\ \frac{-2y}{-2} = \frac{-30}{-2} \\ y = 15 \end{array}$$

$$(3, 15)$$

Step 1: Put both equations in Standard Form ($ax + by = c$)

Step 2: Draw a line under the equations in order to add the equations

Step 3: If neither of the variables cancel out, multiply one or both equations by a number in order to cancel out a variable

Step 4: Solve for the remaining variable

Step 5: Substitute the value into one of the original equations

Step 6: Solve for the remaining variable

Step 7: Write the solution as an ordered pair

Step 8: Check your answer.

Example 2:

Solve the following by Elimination. You should check your answers.

$$\begin{array}{r} 8x + y = -16 \\ -1(-3x + y) = (-5) \cdot -1 \end{array}$$

$$\begin{array}{r} 8(-1) + y = -16 \\ -8 + y = -16 \\ +8 \quad +8 \\ \hline y = -8 \end{array}$$

$$\begin{array}{r} \cancel{8x + y} = -16 \\ \cancel{3x - y} = 5 \\ \hline 11x = -11 \\ \frac{11x}{11} = \frac{-11}{11} \\ x = -1 \end{array}$$

$$(-1, -8)$$

You Try!

Solve the following by Elimination. You should check your answers.

$$8x + 5y = -15$$

$$-3x - 5y = -5$$

You Try!

Solve the following by Elimination. You should check your answers.

$$\begin{array}{r} 8x + 5y = -15 \\ -3x - 5y = -5 \\ \hline \end{array}$$

$$\frac{5x}{5} = \frac{-20}{5}$$

$$\underline{x = -4}$$

$$\begin{array}{r} 8(-4) + 5y = -15 \\ -32 + 5y = -15 \\ \hline +32 \qquad \qquad +32 \end{array}$$

$$\frac{5y}{5} = \frac{17}{5}$$

$$y = 3.4$$

$$\textcircled{(-4, 3.4)}$$

Example 3:
Solve the following by Elimination.

$$\begin{array}{l} 3x - 10y = 6 \\ -2(5x - 5y = 10) \end{array}$$

$$\begin{array}{r} 3x - 10y = 6 \\ -10x + 10y = -20 \\ \hline \end{array}$$

$$\frac{-7x = -14}{-7 \quad -7}$$

$$x = 2$$

$$3x - 10y = 6$$

$$5x - 5y = 10$$

$$2(2x - 3y = 17)$$

$$5x + 6y = 20$$

$$\begin{array}{r} 5x + 6y = 20 \\ 4x - 6y = 34 \\ \hline \end{array}$$

$$\frac{9x = 54}{9 \quad 9}$$

$$x = 6$$

Solve the following by Elimination. You may check your answers.

$$\begin{array}{l}
 1. \begin{cases} -4x - 2y = 14 \\ -10x + 7y = -25 \end{cases} \\
 \hline
 -28x - 14y = 98 \\
 -20x + 14y = -50 \\
 \hline
 -48x = 48 \\
 \frac{-48x}{-48} = \frac{48}{-48} \\
 x = -1
 \end{array}$$

$$\begin{array}{l}
 2. \begin{cases} 5x + 4y = -14 \\ 3x + 6y = 6 \end{cases} \\
 \hline
 30x + 24y = -84 \\
 -12x - 24y = -24 \\
 \hline
 18x = -108 \\
 \frac{18x}{18} = \frac{-108}{18} \\
 x = -6
 \end{array}$$

Solve the following by Elimination. You may check your answers.

$$\begin{array}{l}
 1. \begin{cases} -4x - 2y = 14 \\ -10x + 7y = -25 \end{cases} \\
 2. \begin{cases} -28x - 14y = 98 \\ -20x + 14y = -50 \end{cases} \\
 \hline
 -48x = 48 \\
 \frac{-48x}{-48} = \frac{48}{-48} \\
 x = -1
 \end{array}$$

$$\begin{array}{l}
 2. \begin{cases} 5x + 4y = -14 \\ 3x + 6y = 6 \end{cases} \\
 3. \begin{cases} -15x - 12y = 42 \\ 15x + 30y = 30 \end{cases} \\
 \hline
 18y = 72 \\
 \frac{18y}{18} = \frac{72}{18} \\
 y = 4
 \end{array}$$



Sam spent \$24.75 to buy 12 flowers for his girlfriend. The bouquet contained roses and daisies. How many roses and daisies did Sam buy?

Recreation Casey wants to buy a gym membership. One gym has a \$150 joining fee and costs \$35 per month. Another gym has no joining fee and costs \$60 per month.

- a. In how many months will both gym memberships cost the same? What will that cost be? **6 months; \$360**
- b. If Casey plans to cancel in 5 months, which is the better option for him? Explain. **The second Gym; Gym one's service costs \$325, while Gym two's costs only \$300**

$$150 + 35x = y$$
$$60x = y$$



Landscaping The gardeners at Middleton Place Gardens want to plant a total of 45 white and pink hydrangeas in one flower bed. In another flower bed, they want to plant 120 hydrangeas. In this bed, they want 2 times the number of white hydrangeas and 3 times the number of pink hydrangeas as in the first bed. Use a system of equations to find how many white and how many pink hydrangeas the gardeners should buy altogether.

45 white; 120 pink

$$w + p = 45$$

$$2w + 3p = 120$$



Fitness Rusty burns 5 Calories per minute swimming and 11 Calories per minute jogging. In the morning, Rusty burns 200 Calories walking and swims for x minutes. In the afternoon, Rusty will jog for x minutes. How many minutes must he jog to burn at least as many Calories y in the afternoon as he did in the morning? Round your answer up to the next whole number of minutes.

$$200 + 5x = y$$
$$11x = y$$

34 minutes



Homework

pg. 347 #1-9 (odd)