

Warm Up

February 27, 2019

1.) If x is an **integer**, what is the **maximum** value of x that satisfies the inequality below? *biggest!*

... -3, -2, -1, 0, 1, 2, ...

$$8 - 3(3x - 2) > x - 6$$

$$8 - 9x + 6 > x - 6$$

$$-9x + 14 > x - 6$$

$$\begin{array}{r} +9x \qquad +9x \\ \hline 14 > 10x - 6 \\ +6 \qquad +6 \end{array}$$

$$\frac{20}{10} > \frac{10x}{10}$$

$$2 > x$$

$$x < 2$$

1

2.) Evaluate the expressions if $x = 3$, $y = 2$, $z = 4$, and $w = -5$.

A. $4x^2 + 2$

$$4(3)^2 + 2$$

$$4(9) + 2$$

$$36 + 2 = 38$$

B. $5(z + w)$

$$5(4 - 5)$$

$$5(-1)$$

$$-5$$

3.) The function $a(n) = 3n - 7$ represents the n th term in a sequence. What is the **sum** of the 1st and 5th terms of the sequence?

$$\begin{array}{r} 3(1) - 7 \\ 3 - 7 \\ -4 \end{array} + \begin{array}{r} 3(5) - 7 \\ 15 - 7 \\ 8 \end{array} = 4$$

Main Ideas/Questions	Notes/Examples
Substitution Method	<i>a method of solving systems of equations by substituting one equation into another.</i>
Steps to Solve	<ul style="list-style-type: none"> • Step 1: Solve one equation for <u>x</u> or <u>y</u>. • Step 2: <u>Plug-in</u> this expression into the other equation and <u>solve</u> for the variable. • Step 3: <u>Plug-in</u> your answer into the revised equation from Step 1 and <u>solve</u> for the other variable.

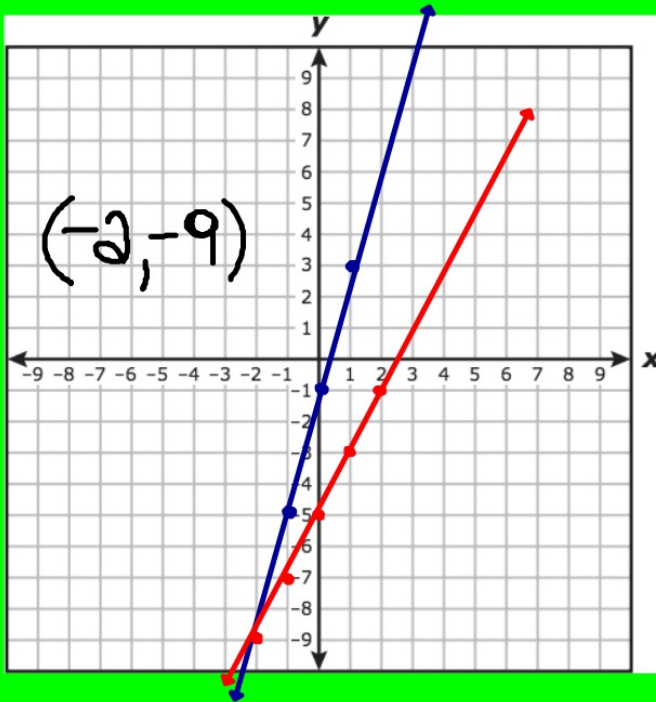
One Solution
(x, y)

• No Solution
 $5 = 6$

Infinite Solution
 $5 = 5$

Best to Use When: When one equation is already solved for x or y (x= / y=)

Graphing



Substitution

$$1. \begin{cases} y = 4x - 1 \\ y = 2x - 5 \end{cases}$$

$$\begin{array}{r} 4x - 1 = 2x - 5 \\ -2x \quad -2x \\ \hline 2x - 1 = -5 \end{array}$$

$$\begin{array}{r} 2x - 1 = -5 \\ +1 \quad +1 \\ \hline 2x = -4 \end{array}$$

$$\begin{array}{r} 2x = -4 \\ \frac{2x}{2} = \frac{-4}{2} \end{array}$$

$$x = -2$$

$$\begin{aligned} y &= 4x - 1 && (-2, -9) \\ y &= 4(-2) - 1 \\ y &= -8 - 1 \\ y &= -9 \end{aligned}$$

$$2. \begin{cases} y = 6x \\ 2x + 3y = -20 \end{cases}$$

$$2x + 3(6x) = -20$$

$$2x + 18x = -20$$

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

$$x = -1$$

$$y = 6x \quad (-1, -6)$$

$$y = 6(-1)$$

$$y = -6$$

$$3. \begin{cases} y = x + 9 \\ 3x + 8y = -5 \end{cases}$$

$$3x + 8(x + 9) = -5$$

$$3x + 8x + 72 = -5$$

$$11x + 72 = -5$$

$$\frac{-72}{11x} \quad \frac{-72}{-72}$$

$$11x = -77$$

$$\frac{11x}{11} = \frac{-77}{11}$$

$$x = -7$$

$$(-7, 2)$$

$$y = x + 9$$

$$y = -7 + 9$$

$$y = 2$$

$$4. \begin{cases} x = 4y + 7 \\ 2x - 6y = 12 \end{cases}$$

$$2(4y + 7) - 6y = 12$$

$$8y + 14 - 6y = 12$$

$$2y + 14 = 12$$

$$\frac{-14}{2y} \quad \frac{-14}{-14}$$

$$2y = -2$$

$$\frac{2y}{2} = \frac{-2}{2}$$

$$y = -1$$

$$x = 4(-1) + 7$$

$$x = 3$$

$$(3, -1)$$

What happens when you don't see $x =$ or $y =$?

$$5. \begin{cases} \cancel{2x + y = 2} & y = -2x + 2 \\ 5x + 3y = -8 \end{cases}$$

Choose ONE variable in ONE equation that would be easiest to isolate.

$$\begin{array}{r} 2x + y = 2 \\ -2x \quad \quad -2x \\ \hline y = -2x + 2 \end{array}$$

$$5x + 3(-2x - 2) = -8$$

$$5x - 6x - 6 = -8$$

$$\begin{array}{r} -x - 6 = -8 \\ +6 \quad +6 \\ \hline -x = -2 \end{array}$$

$$\begin{array}{r} -x = -2 \\ \div -1 \quad \div -1 \\ \hline x = 2 \end{array}$$

$$y = -2x - 2$$

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

$$y = -6$$

$$x = 2 \quad (2, -6)$$

$$6. \begin{cases} 2x - 3y = -11 \\ 2x + y = 9 \end{cases}$$

$$7. \begin{cases} x + 5y = 4 \\ 3x + 15y = -1 \end{cases}$$

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

$$x = -5y + 4$$

$$3(-5y + 4) + 15y = -1$$

$$-15y + 12 + 15y = -1$$

$$12 = -1$$

no solution