

Warm Up

November 20, 2018

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

1

$$\begin{aligned}
 & 8 - 3(3x - 2) > x - 6 \\
 & \textcircled{8} - 9x + \textcircled{6} > x - 6 \\
 & -9x + 14 > x - 6 \\
 & \begin{array}{r}
 -9x + 14 > x - 6 \\
 +9x \quad \quad +9x \\
 \hline
 14 > 10x - 6 \\
 +6 \quad \quad +6
 \end{array}
 \end{aligned}$$

$$\begin{aligned}
 & \frac{20}{10} > \frac{10x}{10} \\
 & 2 > x \\
 & x < 2
 \end{aligned}$$

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

A. $4x^2 + 2$

$$\begin{aligned}
 & 4(3)^2 + 2 \\
 & 4(9) + 2 \\
 & 36 + 2 \\
 & \boxed{38}
 \end{aligned}$$

B. $5(z + w)$

$$\begin{aligned}
 & 5(4 + (-5)) \\
 & 5(-1) \\
 & \boxed{-5}
 \end{aligned}$$

C. $7(z^2 - y^2)$

$$\begin{aligned}
 & 7((4)^2 - (2)^2) \\
 & 7(16 - 4) \\
 & 7(12) \\
 & \boxed{84}
 \end{aligned}$$

Main Ideas/Questions	Notes/Examples
Substitution Method	a method of solving systems of equations by substituting equations within one another
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.

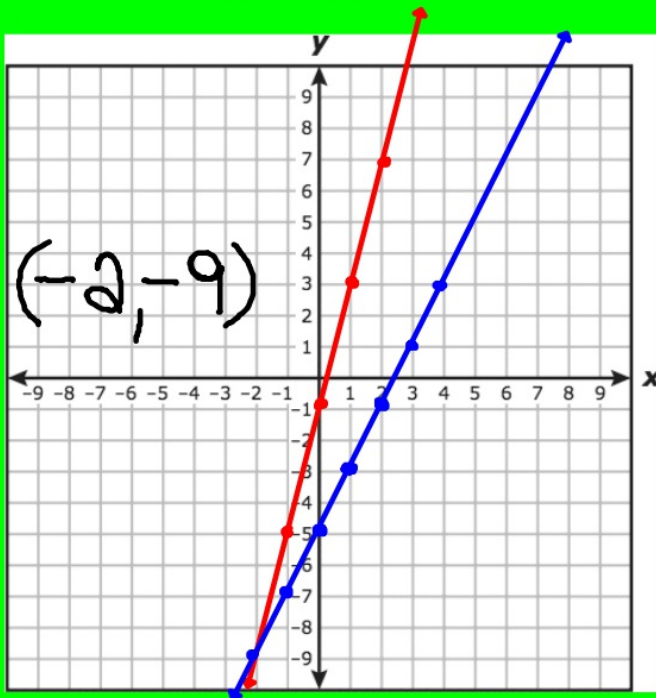
One Solution
(x, y)

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



$$\begin{aligned} 4 &= 2x - 5 \\ 4 &= 2(-2) - 5 \\ 4 &= -9 \end{aligned}$$

Substitution

1. $y = 4x - 1$
 $y = 2x - 5$

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

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

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

$$x = -2$$

$$(-2, -9)$$

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

$$\textcircled{1} y = 6x$$

$$\textcircled{2} 2x + 3(6x) = -20$$

$$\textcircled{3} 2x + 18x = -20$$

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

$$x = -1$$

$$\textcircled{4} y = 6x$$

$$\textcircled{5} y = 6(-1)$$

$$y = -6$$

$(-1, -6)$

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

$$\textcircled{1} y = x + 9$$

$$\textcircled{2} 3x + 8(x + 9) = -5$$

$$\textcircled{3} 3x + 8x + 72 = -5$$

$$11x + 72 = -5$$

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

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

$$x = -7$$

$$\textcircled{4} y = x + 9$$

$$\textcircled{5} y = -7 + 9$$

$$y = 2$$

$(-7, 2)$

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

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

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

$$\textcircled{\#1} \begin{array}{r} 2x + y = -2 \\ -2x \quad \quad -2x \\ \hline y = -2x - 2 \end{array}$$

$$\textcircled{\#2} 5x + 3y = -8$$

$$\textcircled{\#3} 5x + 3(-2x - 2) = -8$$

$$\begin{array}{r} 5x - 6x - 6 = -8 \\ -x - 6 = -8 \\ \quad +6 \quad +6 \\ \hline -x = -2 \end{array}$$

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

$\textcircled{\#4}$

$$\begin{array}{r} 2(2) + y = -2 \\ 4 + y = -2 \\ -4 \quad \quad -4 \\ \hline y = -6 \end{array}$$

$(2, -6)$

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

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

$$\textcircled{\#1} \quad x + 5y = 4$$

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

$\textcircled{\#2}$

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

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

$$12 = -1$$

no sol.