

Warm Up

2/11

Graph the following two equations on the same graph:

$$x + y = 6$$

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

Do they have a common solution?

$$(8, -2)$$

How do we know this is correct?

$$x + y = 6$$

$$(8) + (-2) = 6$$

$$6 = 6 \checkmark$$

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

$$-2 = \frac{1}{2}(8) - 6$$

$$-2 = 4 - 6$$

$$-2 = -2 \checkmark$$

It is correct!

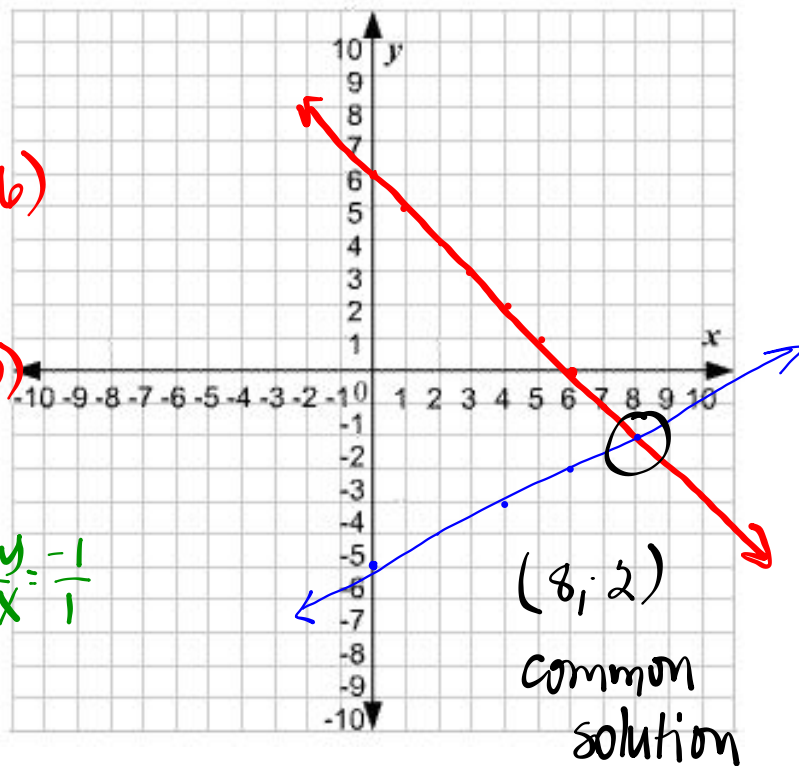
$$x + y = 6$$

$$0 + y = 6$$
$$y = 6 \quad (0, 6)$$

$$x + 0 = 6$$
$$x = 6 \quad (6, 0)$$

$$\begin{array}{r} x + y = 6 \\ -x \quad -x \\ \hline y = -x + 6 \end{array}$$
$$\frac{\Delta y}{\Delta x} = \frac{-1}{1}$$

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



Homework Questions?

Solve.

<p>1. $y = 3 - 2x$ $y = 2 - 3x$ (-1, 5)</p> <p>3. $x - y = 1$ $2x + y = 8$ (3, 2)</p> <p>5. $3x + 4y = 26$ $-2x + y = 1$ (2, 5)</p>	<p>2. $x + y = 5$ $x = y + 7$ (6, -1) <i>$y + 7 + y = 5$ $2y + 7 = 5$</i></p> <p>4. $3x - y = 9$ $y = x + 5$ (7, 12)</p> <p>6. $y = 2x + 3$ $y = 4x + 4$ (-1/2, 2)</p>
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3. $x - y = 1$
 $2x + y = 8 \rightarrow y = 8 - 2x$

There isn't only one way to substitute!
 Pick whichever one feels most comfortable to you.

$x - (8 - 2x) = 1$
 $x - 8 + 2x = 1$
 $3x - 8 = 1$
 $\quad +8 \quad +8$

 $\frac{3x = 9}{3 \quad 3}$
 $x = 3$

$x - y = 1 \rightarrow x = y + 1$
 $2x + y = 8$

$2(y + 1) + y = 8$ **(3, 2)**

$2y + 2 + y = 8$

$3y + 2 = 8$
 $\quad -2 \quad -2$

 $3y = 6$
 $y = 2$

Substitution

- Find which equation has a coefficient of 1 or -1 for either x or y .
- Isolate that variable using properties of equality.
- Substitute the expression that is equal to either the x or y you isolated into the other equation and solve.

<p>1. $y = 3 - 2x$ $y = 2 - 3x$</p> <p>3. $x - y = 1$ $2x + y = 8$ $\begin{array}{r} -2x \quad -2x \\ \hline y = -2x + 8 \end{array}$</p> <p>5. $3x + 4y = 26$ $-2x + y = 1$</p>	<p>2. $x + y = 5$ $x = y + 7$</p> <p>4. $3x - y = 9$ $y = x + 5$</p> <p>6. $y = 2x + 3$ $y = 4x + 4$</p>
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$y + 7 + y = 5$
 $2y + 7 = 5$

#5 $3x + 4y = 26$
 $-2x + y = 1 \rightarrow -2x + y = 1$
 $\begin{array}{r} -2x \quad +2x \\ \hline y = 1 + 2x \end{array}$

$$3x + 4(1 + 2x) = 26$$

$$3x + 4 + 8x = 26$$

$$11x + 4 = 26$$

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

$$\frac{11x}{11} = \frac{22}{11}$$

$$x = 2$$

$$\boxed{(2, 5)}$$

$$-2x + y = 1$$

$$-2(2) + y = 1$$

$$-4 + y = 1$$

$$\begin{array}{r} +4 \quad +4 \\ \hline \end{array}$$

$$y = 5$$

Classwork

#'s 7 - 14

In order to substitute, which variable should we isolate?

Some are already isolated!

7. $2x + 7y = 8$

$x + 5y = 7$

9. $x + 3y = 17$

$2x + 3y = 22$

11. $8x - 5y = 9$

$y = 2x - 4$

13. $3x + y = 5$

$2x + 3y = 8$

8. $y = 4x + 4$

$y = 2x + 8$

10. $4x - 7y = 9$

$y = x - 3$

12. $2x + 4y = -2$

$3x + y = 7$

14. $2x + 6y = 24$

$x - 4y = -2$

Homework

Finish classwork

