Warmup 11/(Solution of 3b-2 = 2b + 12)

1) Find the solution:
$\left\{\begin{aligned} x+y & =8 \\ x+2 y & =11\end{aligned}\right.$
2) Describe, in words, how you would graph the following equation:

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

Which ( $\mathrm{x}, \mathrm{y}$ ) works for BOTH?

$$
\begin{gathered}
x+y=5 \\
x+y=10
\end{gathered}
$$

## NEED:

- Graphing Sheet, Marker, Eraser
$\cdot\left\{\begin{array}{c}x+y=8 \\ x+2 y=11\end{array}\right.$

$\qquad$
11

Which ( $\mathrm{x}, \mathrm{y}$ ) works for BOTH?

$$
\begin{gathered}
y=-\frac{1}{3} x+4 \\
y=\frac{3}{2} x-7
\end{gathered}
$$

| NEED: |
| :--- |
| •Graphing Sheet, Marker, Eraser |
|  |
|  |
|  |
|  |

VERY IMPORTANT to understand:

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



## Vocab

- A system of equations is a set of more than one equation.

Solution of a system: The set of numbers that works in BOTH equations

## Solving by Graphing

- It is pretty difficult to solve most systems just by looking at them. However, if you know how to graph the equations, then finding the point of intersection can be easy!


## Solve by Graphing

$$
\left\{\begin{array}{c}
y=-\frac{1}{3} x+4 \\
y=\frac{3}{2} x-7
\end{array}\right.
$$



## Solve by Graphing

$$
\left\{\begin{array}{c}
y=2 x-9 \\
y=-3 x+6
\end{array}\right.
$$



Checking our solution

$$
\begin{aligned}
& \cdot\left\{\begin{aligned}
& y=-\frac{1}{3} x+4 \text { Solution: }(6,2) \\
& y=\frac{3}{2} x-7
\end{aligned}\right. \\
& \cdot 2=-\frac{1}{3}(6)+4 \\
& \cdot 2=-2+4
\end{aligned}
$$

## Checking THREE points

$$
\left\{\begin{array}{c}
y=2 x-9 \\
y=-3 x+6
\end{array}\right.
$$

1. Substitute the solution $(3,-3)$ into both equations and verify that it works for both.
2. Choose any other point that is on the line $\boldsymbol{y}=\mathbf{2 x}-\mathbf{9}$. Substitute it into BOTH equations. Show that it works in the equation $y=2 x-9$ but not the equation $y=-3 x+6$.
3. Choose any other point that is on the line $\boldsymbol{y}=-3 x+6$. Substitute it into BOTH equations. Show that it works in the equation $y=-3 x+6$ but not the equation $y=2 x-9$.

Solve by Graphing

$$
\left\{\begin{array}{c}
y=-\frac{3}{4} x+7 \\
y=\frac{1}{2} x-3
\end{array}\right.
$$

Early finishers: Check
your solution!!!


Solve by Graphing
$\left\{\begin{array}{c}y=x+3 \\ y=-\frac{1}{3} x-5\end{array}\right.$

Early finishers: Check
your solution!!!


## Graphing: Advice

- You should extend your line to both sides of the graph your solution might be in the negatives!

Solve by Graphing
$\left\{\begin{array}{c}y=\frac{2}{5} x+3 \\ y=-4 x+3\end{array}\right.$

Early finishers: Check your solution!!!


Solve by Graphing
NO SOLUTION!
$\left\{\begin{array}{c}y=-\frac{1}{4} x \\ y=-\frac{1}{4} x-3\end{array}\right.$


What about this?

$$
\left\{\begin{array}{l}
y-3 x=8 \\
y=\frac{1}{4} x-3
\end{array}\right.
$$



What about this?
$\left\{\begin{array}{l}y \quad 3 x=8-y=3 x+8 \\ y=\frac{1}{4} x-3\end{array}\right.$


Another situation when graphing doesn't work...

$$
\left\{\begin{array}{c}
y=\frac{2}{3} x-4 \\
y=-\frac{1}{2} x+5
\end{array}\right.
$$

If your solution ends up in the middle of a box, you should not just use the nearest numbers. This would not be an exact answer!

In this case, you should solve it algebraically.



## Solve by Graphing

$\left\{\begin{array}{l}y=x+7\end{array}\right.$
$y=2 x-8$

Does this mean there is NO solution???

No...it just means our graph isn't big enough

Soon we will learn OTHER strategies you can use when graphing doesn't work.

## Homework

- Textbook p. 239 (1, 2, 3)
- +YOU MUST CHECK YOUR ANSWER!!! (Write this on the page right now!!!)

