Graph the following two equations on the same graph:

$$x + y = 7$$

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

← Easy to graph because it is in slope-intercept form

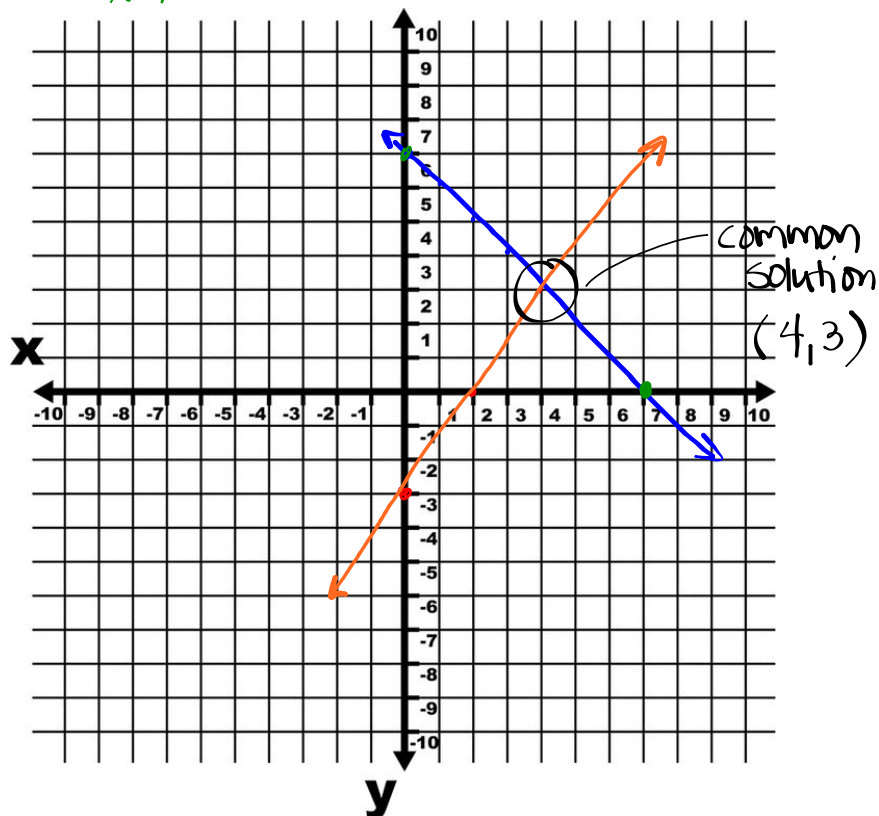Do they have a common solution?

$$x + y = 7$$

Two different graphing options

Find x- and y-ints

$0 + y = 7$

$y = 7$ $(0, 7)$

$x + 0 = 7$

$x = 7$ $(7, 0)$

SI form: $y = -x + 7$

$\frac{\Delta y}{\Delta x} = \frac{-1}{1}$

Common Solution $(4, 3)$

Page 33, #'s 3-8

Solve each system of equations. Find the common solution, which is a coordinate pair.

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

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

5. $\begin{cases} y = -2x - 9 \\ y = 12x + 19 \end{cases}$

$(-3, -14)$

$(7, 28)$

$(2, -13)$

$(-2, -5)$ ✓

We have 2 different answers for #5, let's check which one is correct.

Check for
$(2, -13)$

$y = -2x - 9$

$-13 \stackrel{?}{=} -2(2) - 9$

$-13 = -13$ ✓

$y = 12x + 19$

$13 = 12(2) + 19$

$13 \neq 43$

Only work for one of the equations.

Check for
$(-2, -5)$

$y = -2x - 9$

$-5 = -2(-2) - 9$

$-5 = 4 - 9$

$-5 = -5$ ✓

$y = 12x + 19$

$-5 = 12(-2) + 19$

$-5 = -24 + 19$

$-5 = -5$ ✓

Works for BOTH!

6. $\begin{cases} y = -x + 16 \\ y = -x - 8 \end{cases}$ **7.** $\begin{cases} y = 17x - 6 \\ y = 12x + 44 \end{cases}$ **8.** $\begin{cases} y = -20x + 14 \\ y = -8x - 44 \end{cases}$

No Solution   (10, 164)

Same slope $\frac{\Delta y}{\Delta x} = \frac{-1}{1}$
Different y-int

Parallel
   Lines
Never intersect

$-20x + 14 = -8x - 44$
$ +44 +44$
$\overline{-20x + 58 = -8x}$
$+20x +20x$
$\overline{58 = 12x}$
$\overline{12} \quad \overline{12}$

$\frac{29}{6} = x$

$y = -8x - 44$

$y = -\frac{\overset{4}{\cancel{8}}}{1}\left(\frac{29}{\underset{3}{\cancel{6}}}\right) - 44$

$3\left[y = \frac{-116}{3} - 44\right]$

$3y = -116 - 132$

$\frac{3y}{3} = \frac{-248}{3}$

$y = -\frac{248}{3}$

$\boxed{\left(\frac{29}{6}, \frac{-248}{3}\right)}$

What you need to know for the Inv. 1 Quiz

How to ...

- write **and** graph equations for linear relationships in slope intercept form and standard form

- find the slope, x- and y-intercepts of linear equations

- solve systems of equations by graphing and equivalent expressions

- write system of equations from a word problem

Classwork

For Exercises 9–14, write the equation in $y = mx + b$ form.

9. $4x + 6y + 12 = 0$

10. $-7x + 9y + 4 = 0$

11. $-4x - 2y - 6 = 0$

12. $-x + 4y = 0$

13. $2x - 2y + 2 = 0$

14. $25x + 5y - 15 = 0$

15. A sixth-grade class sells pennants and flags. They earn $1 profit for each pennant sold and $6 profit for each flag sold. They sell 50 items in total for a profit of $115.

a. Write two equations that represent the relationship between the number of pennants sold p and the number of flags sold f.

b. How many pennants and how many flags were sold?

2 ways:
Graph
Equivalent Expressions

16. A seventh-grade class sells mouse pads and cell phone cases with their school logo on them. The class earns $2 profit for each mouse pad sold and $4 profit for each cell phone case sold. They sell 100 items in total for a profit of $268.

    a. Write two equations that represent the relationship between the number of mouse pads sold m and the number of cell phone cases sold c.

    b. How many mouse pads and how many cell phone cases were sold?

Homework

Finish classwork