Warm Up

Write the following equation in Standard Form:

$$y = \frac{3}{2}x - 5$$

$+5 \quad +5$

$y + 5 = \frac{3}{2}x$

$-y \quad -y$

$2\left[5 = \frac{3}{2}x - y\right]$

$10 = 3x - 2y$

$3x - 2y = 10$

$Ax + By = C$

A, B, C are integers

A is positive

The order in which you do things does not matter as long as you are doing the same thing to both sides of the equation.

$$y = \frac{3}{2}x - 5$$

$-\frac{3}{2}x \quad -\frac{3}{2}x$

$-2\left[-\frac{3}{2}x + y = -5\right]$

$\frac{6}{2}x - 2y = 10$

$3x - 2y = 10$

What if we had:

$5\left[\frac{3}{5}x - y = 7\right]$

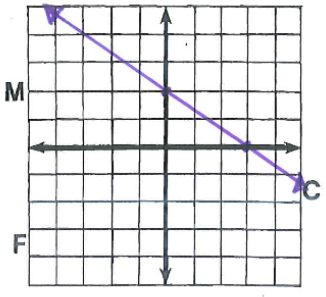
$3x - 5y = 35$

Homework Questions?

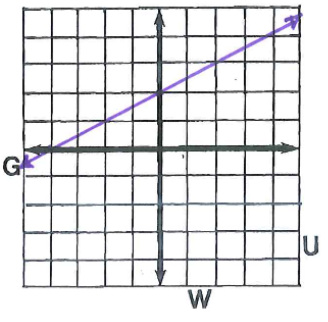
Why Did Miss Muffet Need A Road Map?

Graph any equation below. (Let each space along the axes represent 1 unit.) The graph, if extended, will cross a letter. Look for this letter in the string of letters near the bottom of the page and CROSS IT OUT each time it appears. When you finish, write the letters that have NOT been crossed out in the rectangle at the bottom of the page.

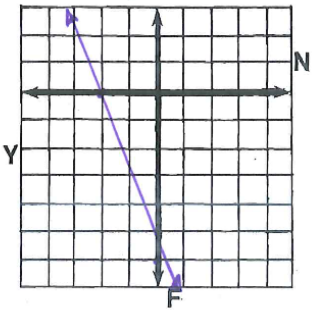
① $2x + 3y = 6$



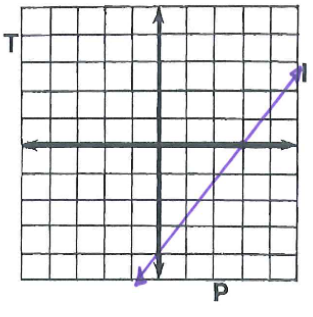
② $-x + 2y = 4$



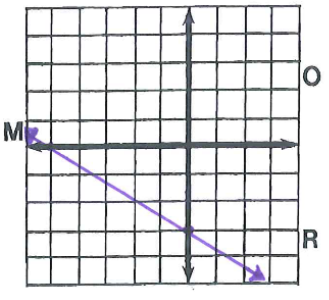
③ $3x + y = -6$



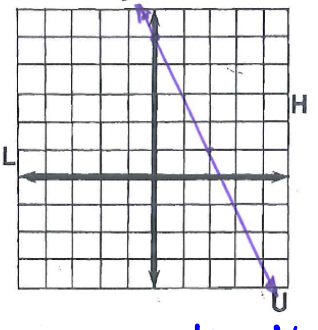
④ $4x - 3y = 12$



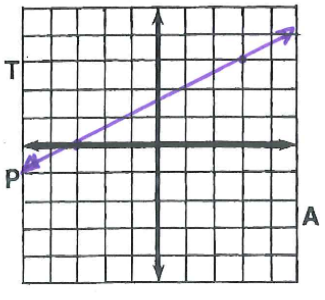
⑤ $-3x - 5y = 15$



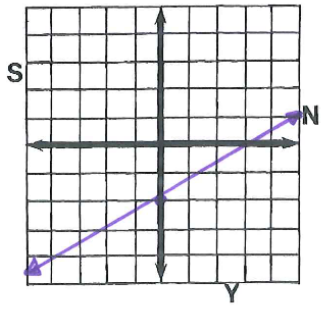
⑥ $2x + y = 5$



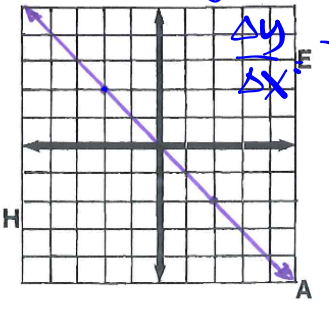
⑦ $x - 2y = -3$



⑧ $-3x + 5y = -10$



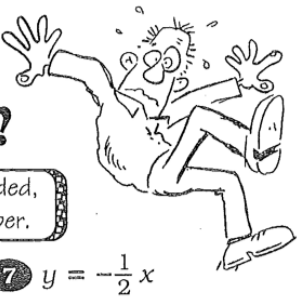
⑨ $x + y = 0$ $y = -x + 0$ $\frac{\Delta y}{\Delta x} \cdot \frac{-1}{1}$



~~R~~ ~~U~~ S H A ~~P~~ N E L A ~~G~~ O ~~N~~ E S A N T ~~M~~ ~~C~~ H ~~I~~ M E A ~~P~~ ~~C~~ R A W N ~~G~~ ? ~~F~~ ~~R~~ H E A ~~N~~ I Y ~~U~~ N

ANSWER: SHE LOST HER WHEY

What Happened to the Guy Who Fell Into an Upholstery Machine?

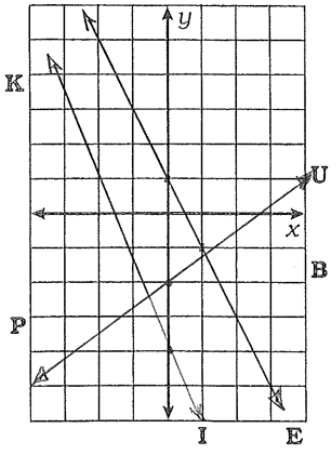


Use the slope and y-intercept to graph each equation. The graph, if extended, will cross a letter. Write this letter in the box containing the exercise number.

1 $y = \frac{3}{4}x - 2$

2 $y = -2x + 1$

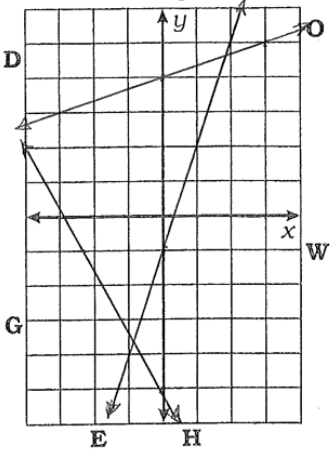
3 $y = -\frac{5}{2}x - 4$



4 $y = \frac{1}{3}x + 4$

5 $y = 3x - 1$

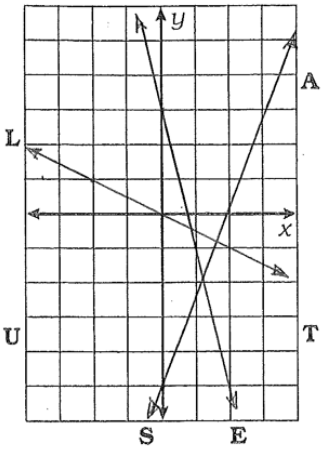
6 $y = -\frac{7}{4}x - 5$



7 $y = -\frac{1}{2}x$

8 $y = -4x + 3$

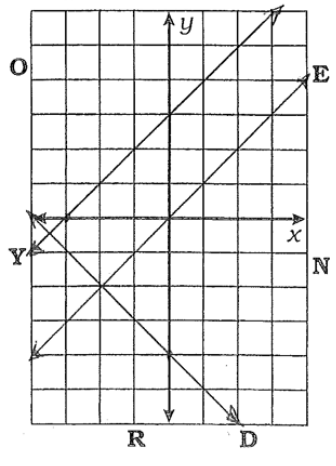
9 $y = \frac{8}{3}x - 5$



10 $y = x + 3$

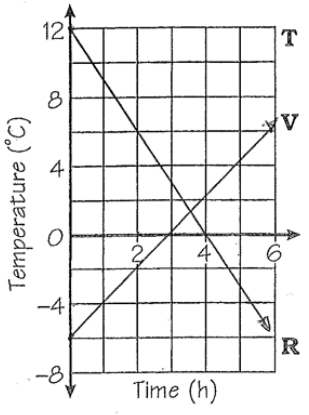
11 $y = -x - 4$

12 $y = x$



13 The temperature is −6°C and rising at a rate of 2° per hour.

14 The temperature is 12°C and dropping at a rate of 3° per hour.

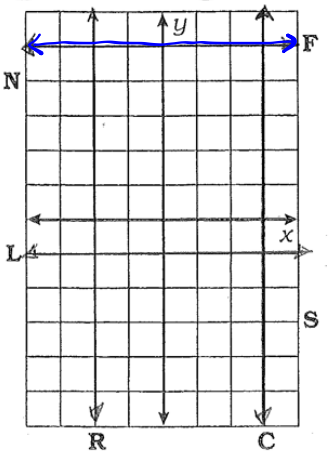


15 $y = 5$

16 $x = -2$

17 $y = -1$

18 $x = 3$



y = 5

6	12	3	9	15	1	17	7	10	14	8	18	4	13	2	16	5	11
H	E	I	S	F	U	L	L	Y	R	E	C	O	V	E	R	E	D

Vocab

Solution: A solution is a coordinate pair that makes an equation balance.

Is (2,7) a solution?

Yes

$3x+1=y$

$3(2)+1 \stackrel{?}{=} 7$

$6+1 \stackrel{?}{=} 7$

$7=7$ ✓

$(1,4)$?

Yes

$3x+1=y$

$3(1)+1 \stackrel{?}{=} 4$

$3+1 \stackrel{?}{=} 4$ ✓

$(3,12)$?

Not a solution

$3x+1=y$

$3(3)+1 \stackrel{?}{=} 12$

$9+1 \neq 12$

$3x+1=y$ is a line. There are an infinite # of solutions on a line.

Symbolically:

You may be asked to solve something "symbolically."

That just means to solve using Algebra.

1.3 Booster Club Members

Intersecting Lines

At a school band concert, Christopher and Celine sell memberships for the band's booster club. An adult membership costs $10, and a student membership costs $5. At the end of the evening, the students had sold 50 memberships for a total of $400. The club president asked,

- How many of the new members are adults and how many are students?

You can answer the question by writing and solving equations that represent the question and the given information.

total

total

Define our variables:

Let x = # of adult memberships

Let y = # of student memberships

System of Equations

$10x + 5y = 400$ ← total $

$x + y = 50$ ← total # of memberships

Problem 1.3

A Let a represent the number of \$10 adult memberships and s represent the number of \$5 student memberships.

1. What equation relates a and s to the \$400 income total? Explain what each term of the equation represents.
2. Find three solutions for your equation from part (1).
3. What equation relates a and s to the total of 50 new members? Explain what each term of the equation represents.
4. Find three solutions for your equation from part (3).
5. Are there any pairs of values for a and s that satisfy both equations?

x y

$10x+5y=400$

$(40,0)$ $(0,80)$ $(20,40)$

Let x = # of adult memberships

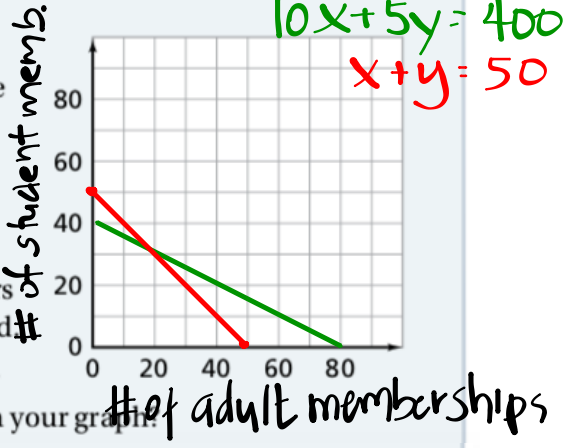
$x+y=50$

$(25,25)$ $(10,40)$ $(0,50)$ $(30,20)$

Let y = # of student memberships

B

1. Graph the two equations from Question A on a grid like the one at the right. Does it matter which variable goes on which axis? Explain.
2. Determine the coordinates of the intersection point. Explain what the coordinates tell you about the numbers of adult and student memberships sold.
3. Could there be a common solution for the two equations that is *not* shown on your graph?
4. Describe situations you have studied in previous Units that are similar to this Problem.



The two equations you wrote to model the conditions of this Problem are called a **system of linear equations.** The coordinates of the intersection point satisfy both equations. These coordinates are the **solution of the system.**

C Use graphic ~~or symbolic~~ methods to solve each system of linear equations. Check your answer.

1. $x + y = 4$ and $x - y = -2$

2. $2x + y = -1$ and $x - 2y = 7$

3. $-2x + y = 3$ and $-4x + 2y = 6$

4. $-2x + y = 3$ and $-4x + 2y = 10$

Graph using grids supplied.

Homework

Finish classwork