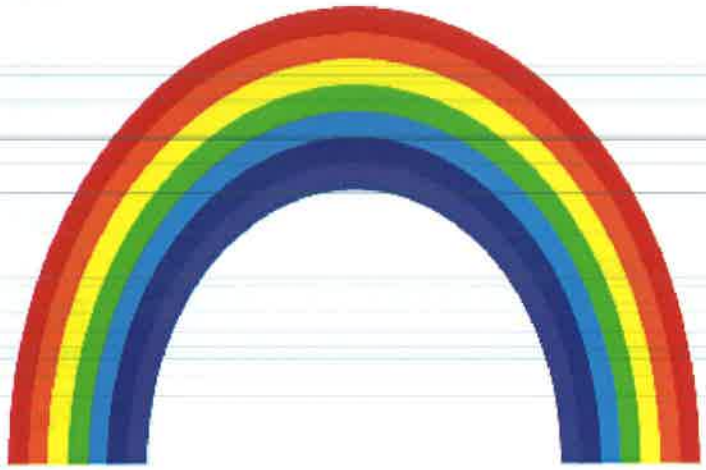
82% missing sections

'S MATH TEXTBOOK

math rocks

Y = Mx+B



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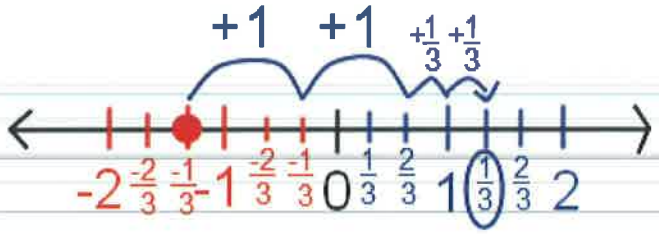
Section 1 - Positive and Negative Numbers



- An integer is a number that does not have fractions or decimals.
- Integers can be positive or negative depending on their position relative to 0.
- Positive numbers are greater than 0 and negative numbers are less than 0 on the same number line.

Here is how to +,-,x, and ÷ positive and negative numbers:

Adding:

+++=+ Example: 2+7=9

-+-=- Example: -11+-8= -19

When adding opposites everything depends on the greater number

+17+-8=+9

-15++3=-12

Multiplying:

+x+=+ Example: +7x+7=+49

-x-= + Example: -4x-3=+12

+x-= - Example: +5x-10=-50

-x+=- Example: -4x+9=-36

Subtraction - Change to addition

5-3=5+-3=2

-4-2=-4+-2=-6

6-(-4)=6+4=10

Division:

+/+=+ Example:+10/+5=+2

-/-=+ Example: -10/-5=+2

+/-=- Example: +10/-2=-5

-/+=- Example: -10/+2=-5

Section 2 - Order of Operations (P.E.M.D.A.S)

Each letter in P.E.M.D.A.S stands for something.

- The letter P stands for (Parentheses).
- The letter E stands for exponents which is when you multiply the same number more than once.
- The letter M stands for multiplication which is a faster way to add the same number more than once.
- The letter D stands for division which is the exact opposite than multiplying.
- The letters A and S stands for addition and subtraction.

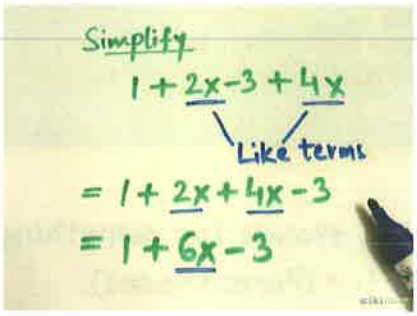
In order to do order of operations you need to work from the inside out.

- Always start with the problem inside the parentheses,
- the exponents comes next
- then multiplication and division whichever comes first, and
- finally addition and subtraction either one first in the problem.

Section 3 - Expressions

Combining Like Terms

- Like terms are terms that have the same variables raised to the same exponents.



Distributive Property

- 5(2x-4) = 5(2x)+5(-4) = 10x-20
-
- A factor with a negative sign must multiply each term of an expression in the ()'s by -1.
    - -(2x-4) = -1(2x)+(-1)(-4) = -2x+4

Section 4 - Equations

1 Step Equations

Examples:

$$y + 51 = 93$$
$$-51 = -51$$
$$y = 42$$

One Step Addition Example

The Opposite of Addition is Subtraction

$$y + 14 = 20$$
$$-14 \quad -14$$
$$y = 6 \checkmark$$

The value which makes the equation true is 6.

$$\frac{3x}{3} = \frac{12}{3}$$
$$x = 4$$

Step 1: $6h = 18$

Step 2: $6h = 18$
$\div 6 \quad \div 6$

Step 3: $\frac{6h}{6} = \frac{18 \div 6}{3}$

Step 4: $h = 3$

2 Step Equations

Examples:

$$-3x + 4 = 16$$
$$-4 \quad -4$$
$$\frac{-3x}{-3} = \frac{12}{-3}$$
$$x = -4$$

1. always undo addition and subtraction.
2. then undo multiplication and division.
3. REMEMBER!!!!! Always check in the original equation!!!!!
   - Check: $-3(-4)+4 = 16$
     $12+4=16$
     $16=16$ ← it checked ☺

Multi-Step Equations with the Variable X on Both Sides

Examples:

SOLVE FOR X:

$15+6x=45+8x$

$15+6x=45+8x$
$-6x \quad -6x$
$15=45+2x$
$-45 \quad -45$
$\frac{-30}{2}=\frac{2x}{2}$
$-15=x$

Check your answer:

$15+6(-15) \stackrel{?}{=} 45+8(-15)$
$15+(-90) \stackrel{?}{=} 45+(-120)$
$-75=-75$ ✔

- Subtract 6x from each side to get X on one side.
- Combine like terms.
- Subtract 45 from each side.
- Simplify both sides.
- Divide each side by 2.
- Check

Equations with a fraction in front of X

Examples:

$\frac{2}{5}x=8$

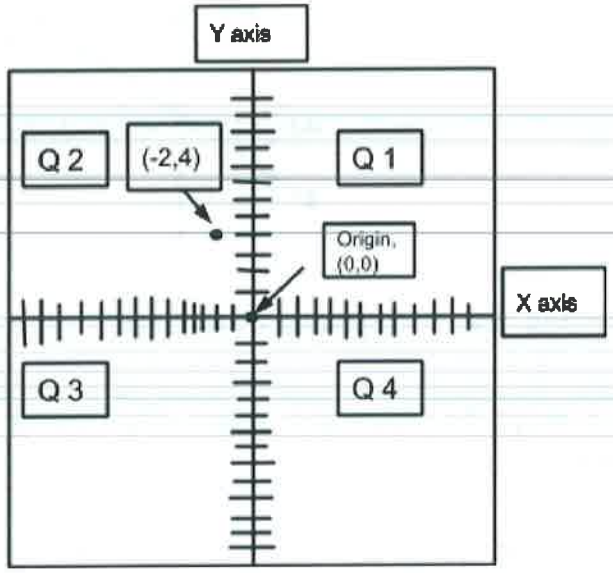
$\left(\frac{2}{5}x\right)\frac{5}{2}=8\left(\frac{5}{2}\right)$

$x=20$

When you solve an equation with a fraction such as ⅖x =8, you can isolate the variable by reversing the fraction (called the reciprocal) and multiplying both sides by the new fraction (5/2).

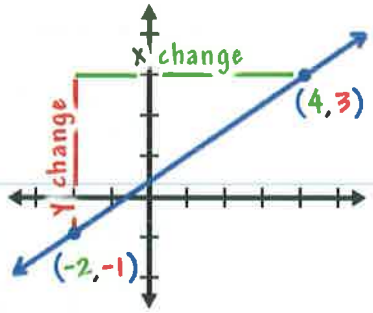
Section 5 - Understanding Points and Lines

The Basics



- the horizontal line is called the x axis
- the vertical line is called the y axis
- the place where the y axis and the x axis intersect is called the origin (0,0).

Slope



Slope describes the steepness of a line.

There are 2 ways to calculate slope depending on if you are given a graph or given 2 points.

METHOD 1 - If you are given a graph, like the picture above:

1. draw a triangle on top
2. Find slope=rise/run from the two dots on the graph.

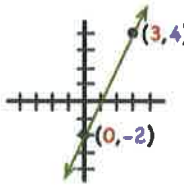
- There are 2 lines 1 horizontal and 1 vertical that overlap each other
- The points you use must be integers.
- The red is the rise. The red line is rise because its goes up or down.
- The light green is the run. The green line is run because its going left or right
- To determine the slope, just do m= rise/run = 4/6. Reduce and m=⅔.

Example

Find the Slope

A line passing through (0,-2) and (3,4)

$x_1\ y_1 \qquad x_2\ y_2$



$$\text{Slope} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

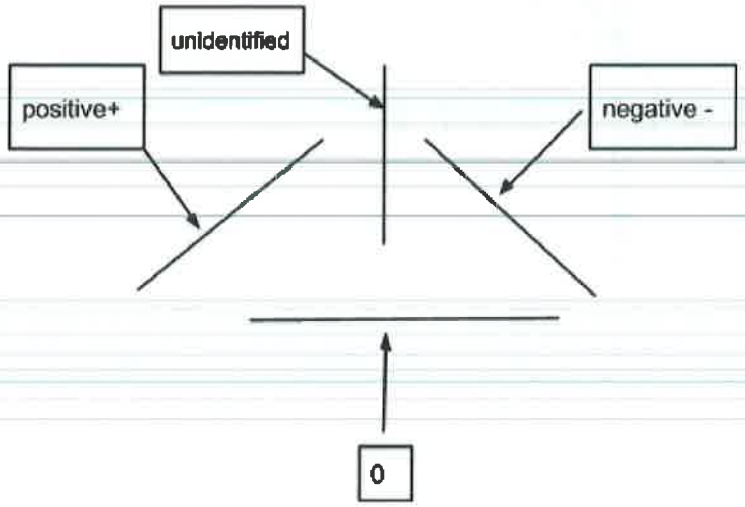
$$= \frac{4-(-2)}{3-0} = \frac{6}{3}$$

METHOD 2 - Finding the slope with 2 points

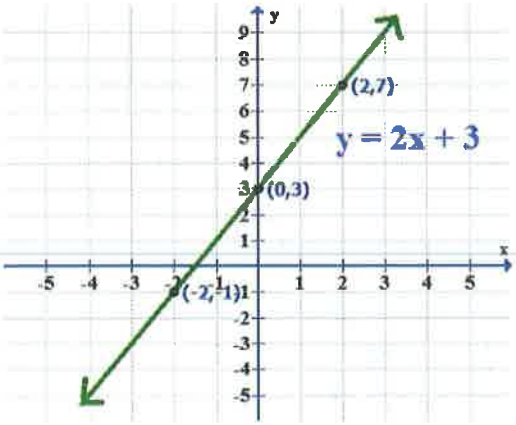
1. Put the 2 points in order like the one in the example above
2. subtract the numbers on the top as well as the numbers on the bottom
3. divide the two answers together in order to get the slope

There are 4 types of slopes for lines: 1 line is positive, 1 negative one 0, and 1 unidentified

Example:



Y-intercept



Example

The Y-intercept is the point where the line crosses the y-axis and is the ordered pair (0,b). In this case the y-intercept is (0,3).

Slope-Intercept Form

A linear equation of the form y=mx+b is written in slope-intercept form where

- m is the slope and
- b is the y-intercept of the equation's graph.

Example

$y = mx + b$

slope y-intercept

$y = 2x + 3$

slope y-intercept

2/1 is the slope

(0,3) is the y intercept

$9x-3y=27$

1. switch numbers around until it says 3y=9x-27
2. divide all numbers by 3. The answer should be y=3x-9

Section 6 - Graphing Lines

- A relationship between two variables whose graph appears to be linear can be represented by an equation containing variables.

1. Begin by making a table of values for the equation given.

Example: y=x+6

X	Y
-2	4
-1	5
0	6
1	7
2	8

does not fit

You can make a table of values vertically like the example above or horizontally. It does not really matter. You make it whatever you prefer.

2. Label the first column "x" and the second column "y"
3. Place the equation on top or near the table of values.
4. Then you are ready to substitute the values in for "x" and figure out values for "y",or vice versa. Whatever is easiest to solve for.
5. Whatever ordered pair you get for (x,y) is the coordinate you will be graphing.

Graphing lines with X and Y intercepts

Vocabulary:

1. Use This method if the equation of the line is in standard format

Standard format: Ax+By=C where A,B,C are integers

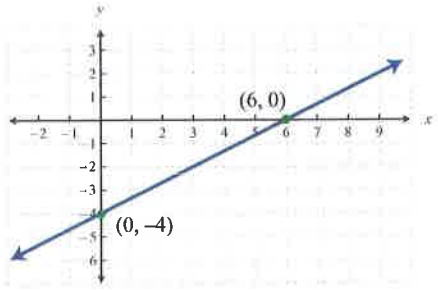
2. Integers are numbers ...-3,-2,-1,0,1,2... integers do not have decimals and fractions
3. X intercept

Is a point on the x axis. The y-coordinate is always 0. The x intercept is (x,0)

4. Y intercept

Is a point on the y axis. The x-coordinate is always 0. The y-intercept is (0,y)

Example:



Find the intercepts for 9x+6y=18

1. Write original equation

2. Substitute 0 for y.
3. The x-intercept is 2. (2,0)
4. Write original equation
5. Substitute 0 for x.
6. The y-intercept is 3. (0,3)