

$y = mx + b$ Review $Ax + By + C = 0$

a) In this equation of a line in general or functional form?
 b) Convert the following equation of a line from its general form into the slope form
 c) Find the slope, y-intercept and x-intercept of this line

$12x + 10y - 3 = 0$ → $C = -3$

$10y = -12x + 3$

$y = \frac{-12x + 3}{10}$

$y = -1.2x + 0.3$ → $y = mx$

$12x + 10y - 3 = 0$

$12x - 3 = -10y$

$\frac{12x - 3}{-10} = \frac{-10y}{-10}$

$-1.2x + 0.3 = y$

$y = -1.2x + 0.3$ → $y = mx + b$

Slope $m = -1.2$

$b = 0.3$

$-0.3 = -1.2x$

$-1.2x = -0.3$

$x = \frac{-0.3}{-1.2} = \frac{1}{4}$

Sep 18-8:56 PM

PLAN

1. Test Survey
2. Equation of a line
3. Homework MHS

odyroutree.weebly.com

Sep 18-2:20 PM

Mr. Rountree's Recup hours

Day 1 and 8 12:30-1:05 (Heritage Turf)

Any other lunch hour by appointment (at least 1 day in advance booking)

Sep 18-2:21 PM

INTERCEPTS OF A LINE

x-intercept: where a line intercepts the x-axis coordinate: (x, 0)

****Y value of the x-intercept is ALWAYS 0****

y-intercept: where a line intercepts the y-axis coordinate: (0, y)

****X value of the y-intercept is ALWAYS 0****

Sep 5-9:18 AM

ex:

x-intercept: 7 or (7, 0)

y-intercept: 8 or (0, 8)

Sep 5-9:45 AM

In each of the following cases draw the line knowing that

a) - the x-intercept is equal to 2.
- the y-intercept is equal to 1.

b) - the x-intercept is equal to -2.
- the y-intercept is equal to 2.

c) - the x-intercept is equal to 1.
- the y-intercept does not exist.

d) - the x-intercept does not exist.
- the y-intercept is equal to 3.

In each of the following cases, draw the line knowing that

a) - the slope is equal to $\frac{3}{2}$.
- the y-intercept is equal to 2.

b) - the slope is equal to $-\frac{3}{2}$.
- the y-intercept is equal to 4.

c) - the slope is zero.
- the y-intercept is equal to 3.

d) - the slope is equal to 2.
- the y-intercept is equal to 2.

$0 = -1.5$

$0 = -1.0$

Sep 5-9:51 AM

EQUATION OF A LINE
FUNCTIONAL FORM

$y = ax + b$

$y = \frac{2}{3}x + 4$

slope = a

ex: $y = \frac{2}{3}x - 4$ Where the slope is $\frac{2}{3}$ and the y-intercept (initial value) is 4

$a \neq 0$ and $b \neq 0$ Ex: $y = -2x + 3$ Oblique line not passing through the origin.	$a = 0$ and $b \neq 0$ Ex: $y = 2$ Horizontal line	$a \neq 0$ and $b = 0$ Ex: $y = \frac{2}{3}x$ Oblique line passing through the origin.
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Sep 1-11:52 AM

Given the following lines determine the slope and y-intercept:

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

2 $y = 2x - 1$

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

$y = 2x - 3$

slope = $-\frac{2}{1}$

Sep 5-9:11 AM

Given the line $l: y = -\frac{3}{4}x + 3$

a) Determine

- its slope; $-\frac{3}{4}$
- its y-intercept.

b) Draw the line l in two different ways:

- using the slope and y-intercept.
- using a table of values.

$y = -\frac{3}{4}x + 3 \rightarrow y = -\frac{3}{4}(4) + 3 = 0$

$y = -\frac{3}{4}(19) + 3 = 11.25$

Determining the slope and the y-intercept?

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

$a = \frac{1}{3}$

Sep 5-9:52 AM

Why does it matter?

In function form $y = ax + b$

we know a is the slope (rate of change)

b is the y intercept (initial value)

$-\frac{b}{a}$ is the x intercept

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

$0 = 2x + \frac{1}{3}$

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

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

Oct 4-7:04 AM

Review

A) Find the equation of a line with coordinates $(2, 4)$ and $(6, 8)$

B) What are the y and x intercepts of this line

C) Graph it

$a = \frac{8-4}{6-2} = \frac{4}{4} = 1$

$y = ax + b$

$y = 1x + b$

$4 = 1(2) + b$

$4 = 2 + b$

$4 - 2 = b$

$2 = b$

$y = 1x + 2$

$0 = 1x + 2$

$0 - 2 = x$

$-2 = x$

Oct 4-7:07 AM

How to determine the equation when we know the slope and y-intercept?

$y = ax + b$

Just plug in values

Example 1:

What is the equation of a line with slope 3 and y-intercept of -4?

$y = 3x + (-4)$

$y = 3x - 4$

Oct 8-7:03 PM

How to determine the equation when we know the slope and one point

You only need to find b since we have slope

Write: $y = ax + b$
 plug all the values into the equation

If you know more than one point, choose only one point and plug it in.

Oct 8-7:02 PM

Example 1:
 Find the equation of the line that has a slope of 3 and goes through (2, 10)

$y = ax + b$
 $y = 3x + b$
 $10 = 3(2) + b$
 $10 = 6 + b$
 $10 - 6 = b = 4$

$y = 3x + 4$
 $0 = 3x + 4$

Oct 8-6:58 PM

How to determine the equation when we know 2 points (x_1, y_1) and (x_2, y_2)

1) find a $a = \frac{y_2 - y_1}{x_2 - x_1}$

2) then find b

write $y = ax + b$
 plug in a, then use one of the known points and plug in x and y

c) write the rule $y = ax + b$
 Use the values you found in steps 1 and 2 instead of the letters a and b.

Oct 8-6:55 PM

EQUATION OF A LINE
 GENERAL FORM

n.b. (important: **A** must be positive)

$Ax + By + C = 0$

**Note: the equation MUST = 0 and NO FRACTIONS OR DECIMALS

a is NOT the slope
 b is NOT the y-intercept

$y = ax + b$
 $x + y + \dots = 0$
 $y = \frac{1}{2}x$
 $10x = 0$

Sep 5-9:15 AM

Are the following equations in function form, General form or neither...

$y = ax + b$ (circled)

$y = 2x + 6 \rightarrow F$

$12x + 10y - 3 = 0 \rightarrow G$

$y = 5x \rightarrow F$

$2x + 6 = 12 \rightarrow N$

$5x + y = 0 \rightarrow G$

$5x + y + 0 = 0$

Oct 4-7:01 AM

Hints

If Y is on one side alone: function form

If there is a 0 on one side alone: general form

Oct 4-7:03 AM

CALCULATING THE INTERCEPTS OF A LINE

To determine the x-intercept: replace 'y' by 0 in the equation.
 To determine the y-intercept: replace 'x' by 0 in the equation.

ex: $2x - 3y + 6 = 0$ $y = ax + b$

x-intercept

$$2x - 3y + 6 = 0$$

$$2x - 3(0) + 6 = 0$$

$$2x - 0 + 6 = 0$$

$$2x + 6 = 0$$

$$2x = -6$$

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

$$x = -3$$

y-intercept

$$2x - 3y + 6 = 0$$

$$2(0) - 3y + 6 = 0$$

$$0 - 3y + 6 = 0$$

$$-3y + 6 = 0$$

$$-3y = -6$$

$$y = \frac{-6}{-3}$$

$$y = 2$$

Final Equation: $y = \frac{2}{3}x + 2$

Sep 5-10:12 AM

Identify the slope, y intercept and x intercept for each equation

- $y = 3x - 6$
- $y = 0.5x + 4$
- $y = 8x + 24$
- $y = 6x$

Oct 4-7:11 AM

Identify the slope, y intercept and x intercept for each equation

- $2x + y - 6 = 0$
- $6x - 12y + 24 = 0$
- $8x - 4y + 32 = 0$
- $2x + 4y = 0$

Oct 4-7:13 AM

When is this useful?

Example. Find the distance from A to B

Equation of line $20x + 40y = 2400$

Sep 12-12:01 PM

CONVERTING GENERAL TO FUNCTIONAL

$2x + 3y + 6 = 0$ $y = ax + b$

$$2x + 3y + 6 = 0$$

$$3y = -2x - 6$$

$$y = \frac{-2x - 6}{3}$$

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

$3x + 5y - 2 = 0$

$$3x + 5y - 2 = 0$$

$$5y = -3x + 2$$

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

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

$-3x + 4y - 12 = 0$

Sep 5-9:58 AM