

Algebra 1 4.1

Write and graph linear equations in slope-intercept form.

Model data with equations in slope-intercept form

linear - line

slope - $\frac{\text{rise}}{\text{run}} \quad \frac{12}{8} = \frac{3}{2}$

y-intercept

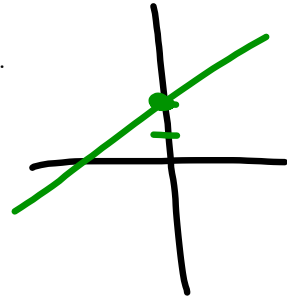
$y = mx + b$

constant function

y = number
y = b

(cross y-axis (0, 2))

Village People



Song

Whiteboards

Oct 29-6:30 PM

KeyConcept Slope-Intercept Form



Words

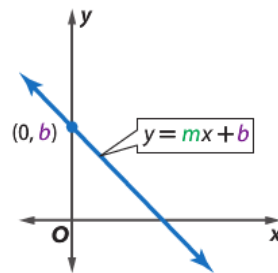
The slope-intercept form of a linear equation is $y = mx + b$, where m is the slope and b is the y-intercept.

Example

$y = mx + b$

$y = 2x + 6$

slope \uparrow y-intercept



Oct 29-6:36 PM

$$Y = MX + B$$

(YMCA)

Students, we need to graph a straight line.
 I said, students, we will have a great time.
 I said, students there's no reason to whine.
 There's no need to be unhappy...

It's fun to graph $y = mx + b$

$$y = mx + b$$

It makes a straight line and it'll be fine

You can even find the slo-ope!

(repeat)

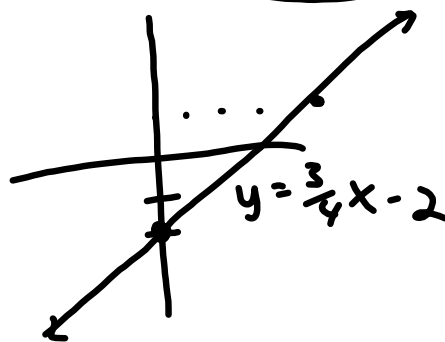
Oct 29-6:35 PM

Example 1 Write and Graph an Equation

Write an equation in slope-intercept form for the line with a slope of $\frac{3}{4}$ and a y -intercept of -2 . Then graph the equation.

$$y = m x + b$$

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



Oct 29-6:36 PM

Where should I start?...

Guided Practice

Write an equation of a line in slope intercept form with the given slope and y -intercept. Then graph the equation.

1A. slope: $-\frac{1}{2}$, y -intercept: 3

1B. slope: -3 , y -intercept: -8

Oct 29-6:36 PM

Whiteboards

Write an equation of a line in slope-intercept form with the given slope and y -intercept. Then graph the equation.

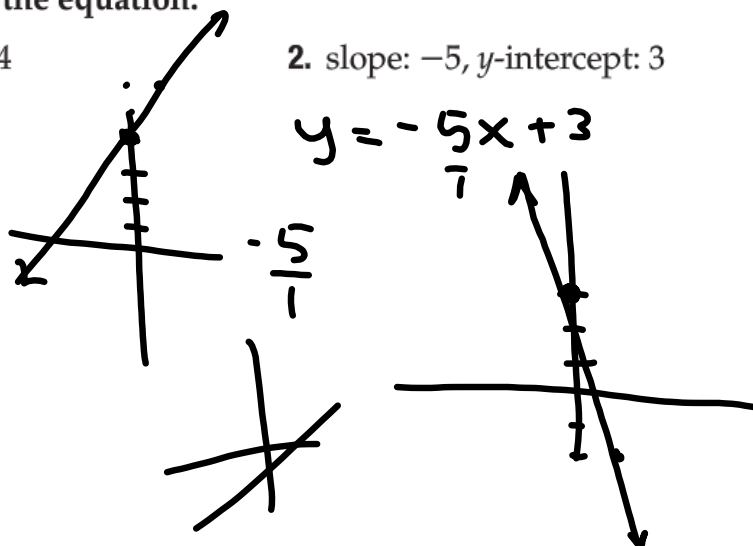
1 slope: 2, y -intercept: 4

$y = 2x + 4$

$y = \frac{2}{1}x + 4$

2. slope: -5 , y -intercept: 3

$y = -5x + 3$



Oct 29-6:39 PM

$$y = mx + b$$

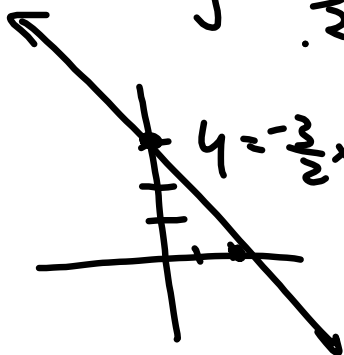
Example 2 Graph Linear Equations

Graph $3x + 2y = 6$.

$$\frac{-3x}{-2} \quad \frac{-6}{-2}$$

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

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



Find slope and y-int
Hint: $y = mx + b$

Rearr.

1. zero pairs x
2. divide y =

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

Oct 29-6:37 PM

$$y = mx + b$$

Guided Practice

Graph each equation.

2A. $3x - 4y = 12$

$$\frac{-3x}{-4} \quad \frac{-12}{-4}$$

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

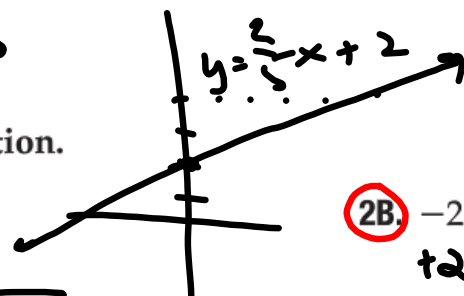
$$y = \frac{3}{4}x - 3$$

2B. $-2x + 5y = 10$

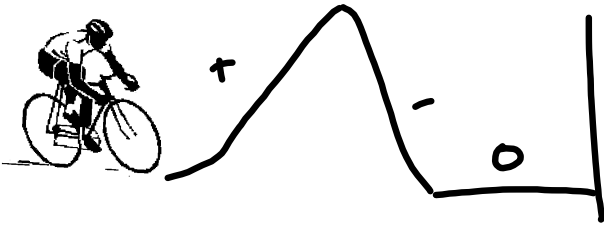
$$\frac{-2x}{5} \quad \frac{10}{5}$$

$$\frac{5y}{5} = \frac{2x}{5} + \frac{10}{5}$$

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



Oct 29-6:37 PM



Can he ride...

- up hill?
- down hill?
- horizontally? $\frac{0}{5} = 0$
- up a vertical wall? $\frac{5}{0} = \text{undef}$

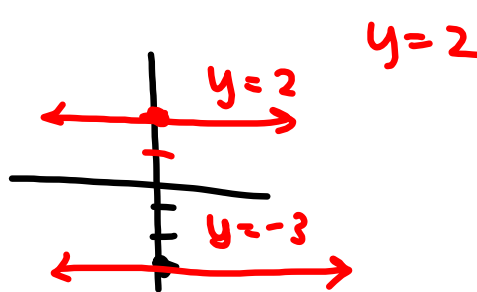
$$\begin{array}{r} 2x - y = 8 \\ -2x \quad -2x \\ \hline -y = -2x + 8 \\ y = 2x - 8 \end{array}$$

Oct 29-6:41 PM

$y = mx + b$

Example 3 Graph Linear Equations

Graph $y = -3$.



Bicycles: constant slope
 $y = \text{constant}$ describes vertical distance (x,y)
 so $y = 2$ would be always "up 2" etc.

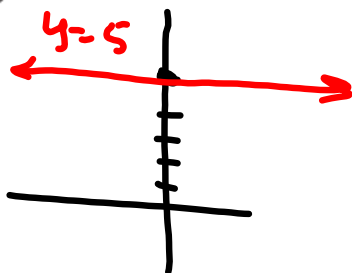
(y-axis is vert.)

Oct 29-6:37 PM

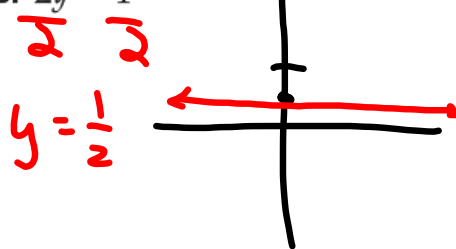
Guided Practice

Graph each equation.

3A. $y = 5$



3B. $2y = 1$



Oct 29-6:38 PM

What do we need to know?

Standardized Test Example 4 Write an Equation in Slope-Intercept Form



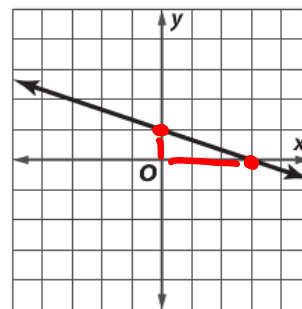
Which of the following is an equation in slope-intercept form for the line shown?

A $y = -3x + 1$

~~B $y = -3x + 3$~~

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

~~D $y = \frac{1}{3}x + 3$~~



Oct 29-6:38 PM

Guided Practice

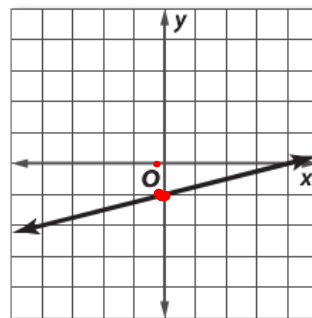
4. Which of the following is an equation in slope-intercept form for the line shown?

F $y = \frac{1}{4}x - 1$

~~G~~ $y = \frac{1}{4}x + 4$

~~H~~ $y = 4x - 1$

~~J~~ $y = 4x + 4$

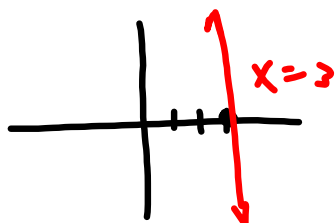


Oct 29-6:38 PM

WB 4.1

$y = 6 \Rightarrow$ horizontal $m = 0$

$x = 3 \Rightarrow$ vertical $m = \text{undef}$ $\frac{3}{0}$



Oct 29-6:31 PM

Attachments



ymca1[1].au