

Algebra 1

4.1

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

Write and graph linear equations in slope-intercept form.
Model data with equations in slope-intercept form

linear

slope

y-intercept

$y = mx + b$

constant function

$$y = 6$$

Song

Whiteboards

"straight" line

$$m = \frac{\text{rise}}{\text{run}}$$

cross y-axis

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

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

Village

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

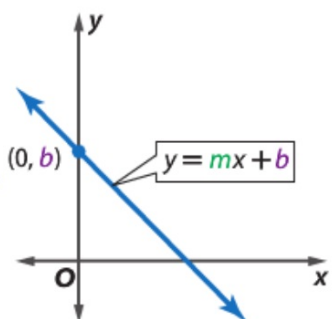
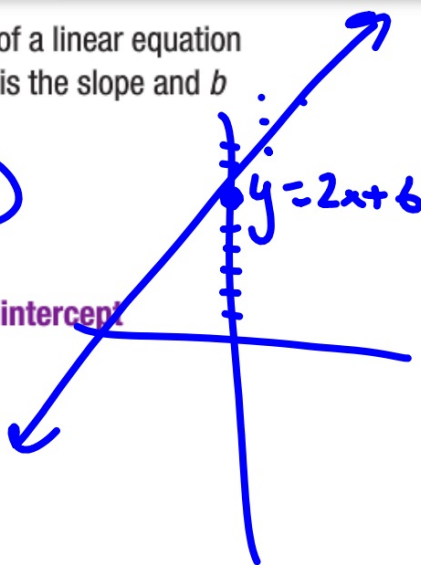
$$y = mx + b$$

$$y = 2x + 6$$

slope $\uparrow$

$\uparrow$ y-intercept

$\frac{2}{1}$



$$Y = MX + B$$

(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

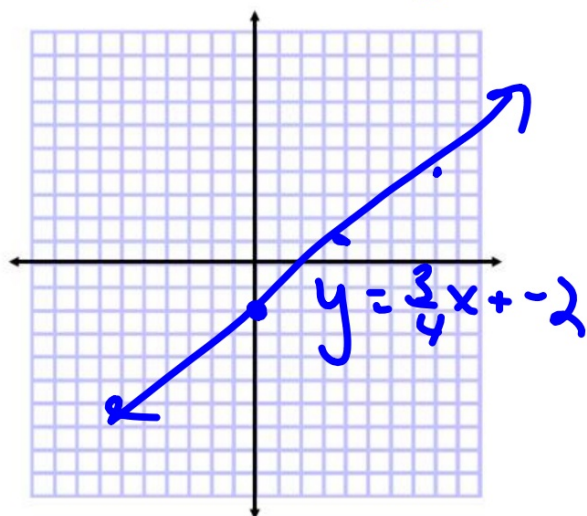
You can even find the slo-o-pe!

(repeat)

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.

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



Where should I start?...

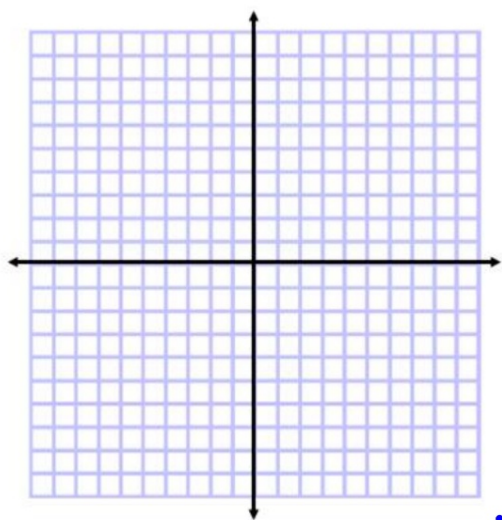
$$y = mx + b$$

Guided Practice

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

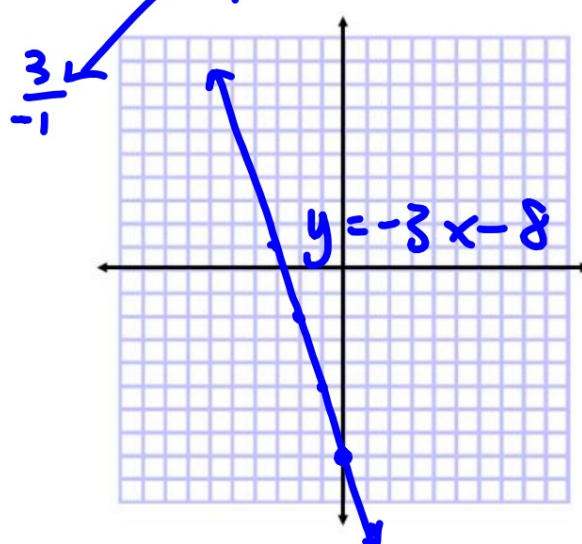
1A. slope: $-\frac{1}{2}$, y -intercept: 3

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



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

$$y = -3x - 8$$

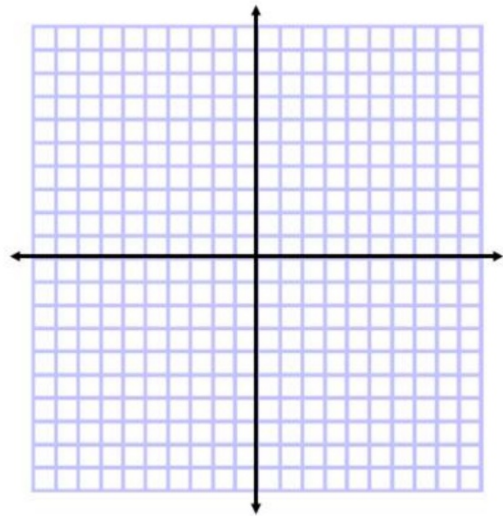
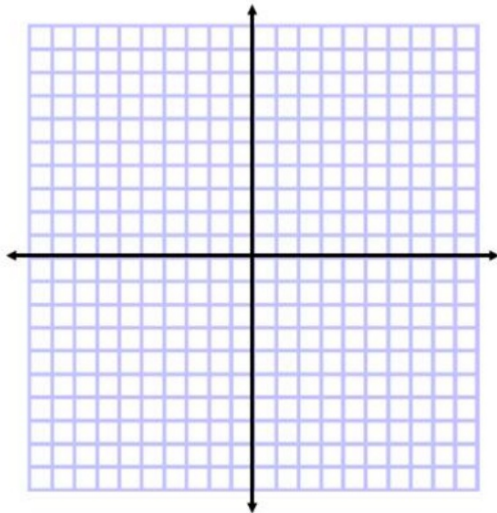


Whiteboards

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
7

2. slope: -5, y -intercept: 3
7



Example 2 Graph Linear Equations

Graph $3x - 2y = 6$.

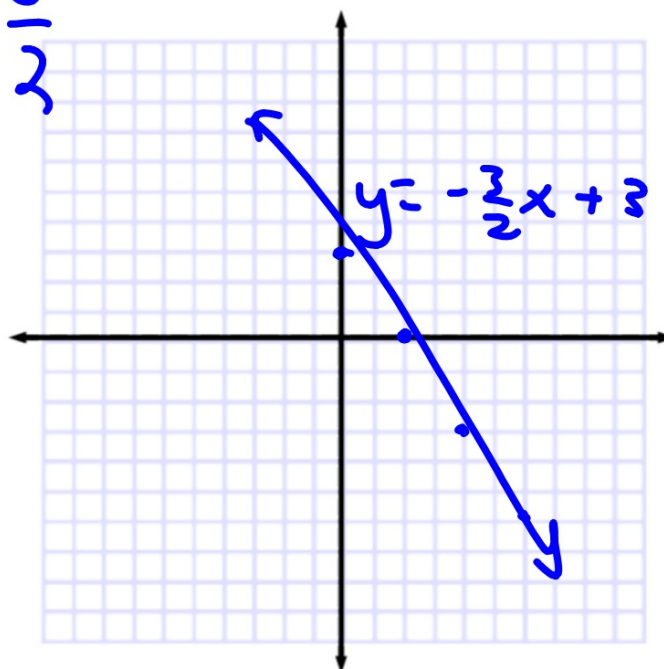
$$\begin{array}{r} -3x \quad -3x \\ \hline \end{array}$$

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

* $\boxed{y = -\frac{3}{2}x + 3}$
 $y = -1.5x + 3$

$$f(x) = -\frac{3}{2}x + 3$$

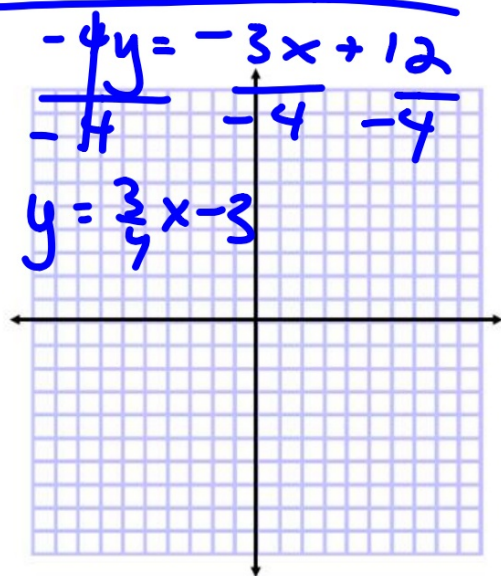
Find slope and y-int
Hint: $y = mx + b$



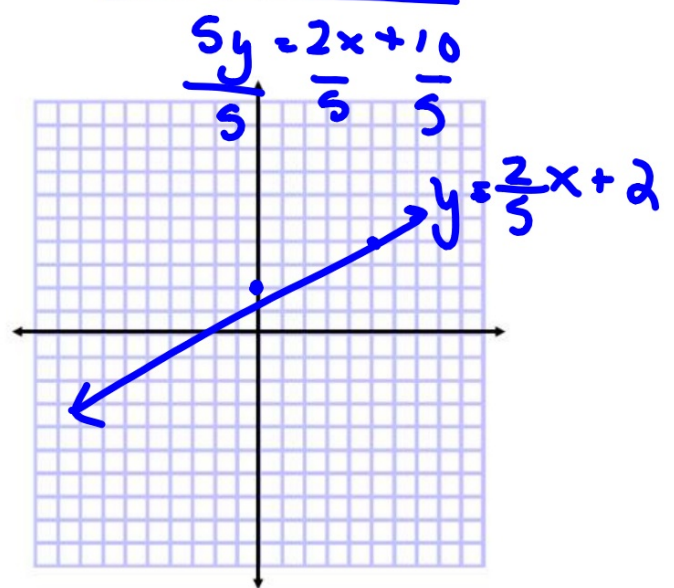
Guided Practice

Graph each equation.

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



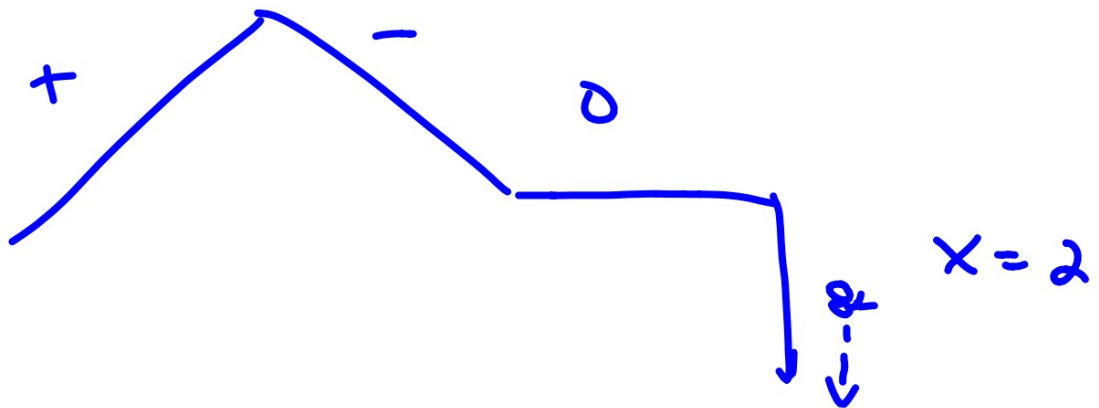
2B. $-2x + 5y = 10$
 $+2x \quad +2x$





$$y = b$$

Can he ride...
up hill?
down hill?
horizontally?
off a cliff?

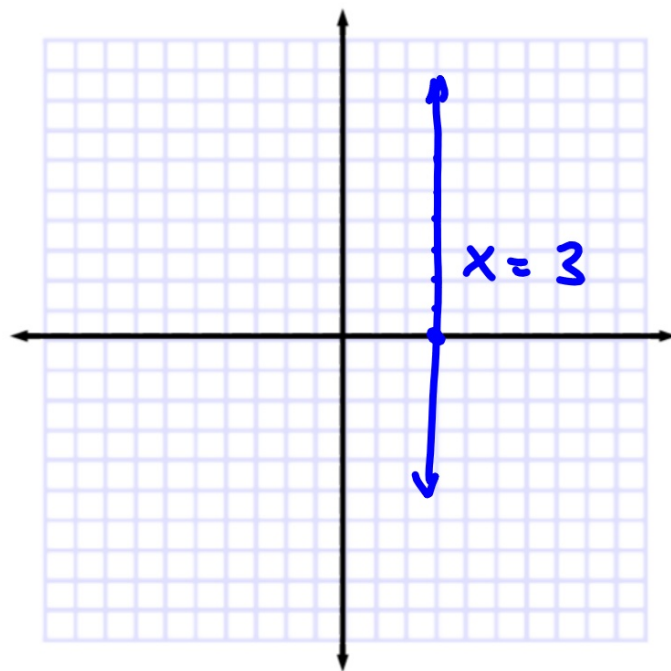


Example 3 Graph Linear Equations

Graph $y = -3$.

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

$$x = 3$$

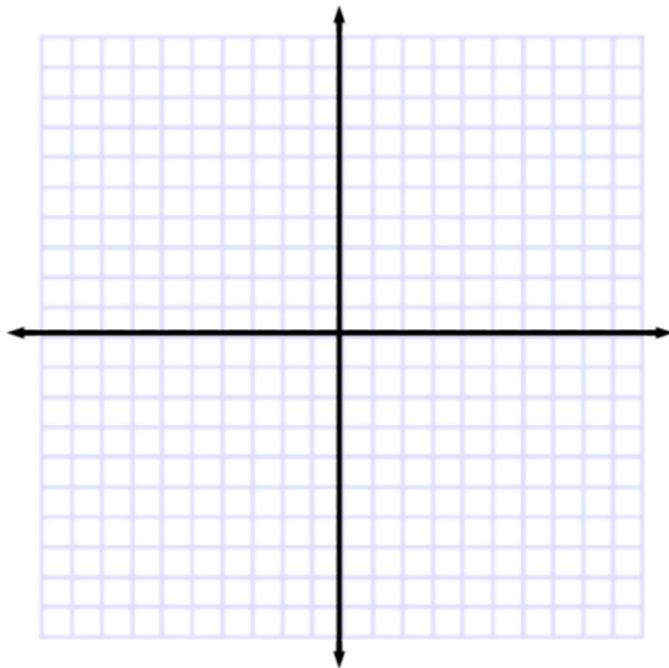


GuidedPractice

Graph each equation.

3A. $y = 5$

3B. $2y = 1$



What do we need to know?

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



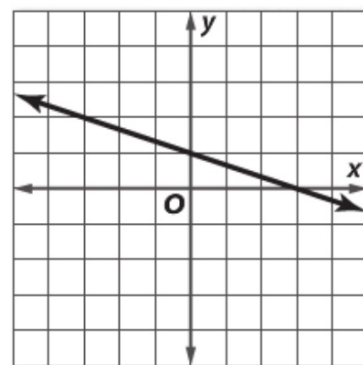
Which of the following is an equation in slope-intercept form for the line shown?

A $y = -3x + 1$

B $y = -3x + 3$

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

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



Guided Practice

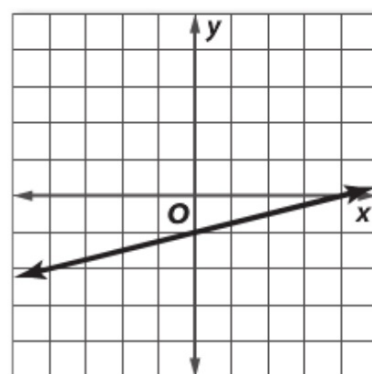
4. Which of the following is an equation in slope-intercept form for the line shown?

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

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

H $y = 4x - 1$

J $y = 4x + 4$



p 220
17-35 odd
39-49 odd