Algebra 1 4.1

$y = mx + B$

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

Song

Whiteboards

KeyConcept Slope-Intercept Form

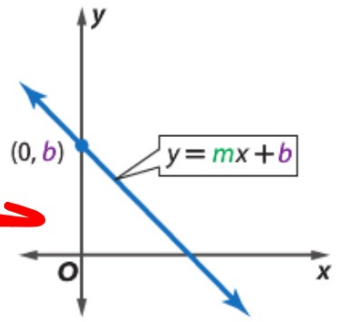
Words The slope-intercept form of a linear equation is $y = mx + b$, where m is the slope and b is the y-intercept.

Example

$y = mx + b$

$y = 2x + 6$

slope — y-intercept



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)

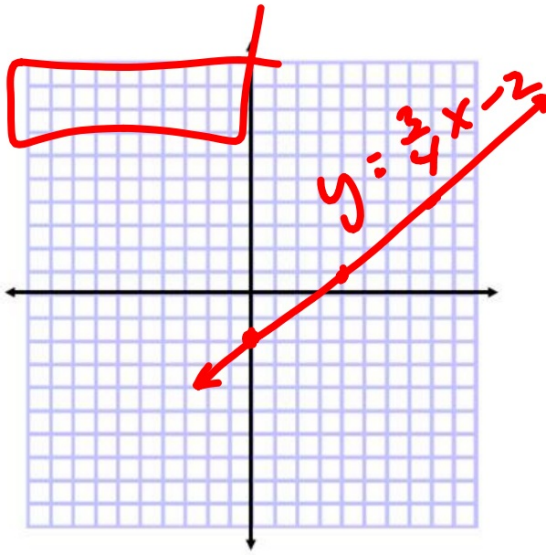
Example 1 Write and Graph an Equation

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.

$y = mx + B$

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

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



$y = mx + B$

Where should I start?...

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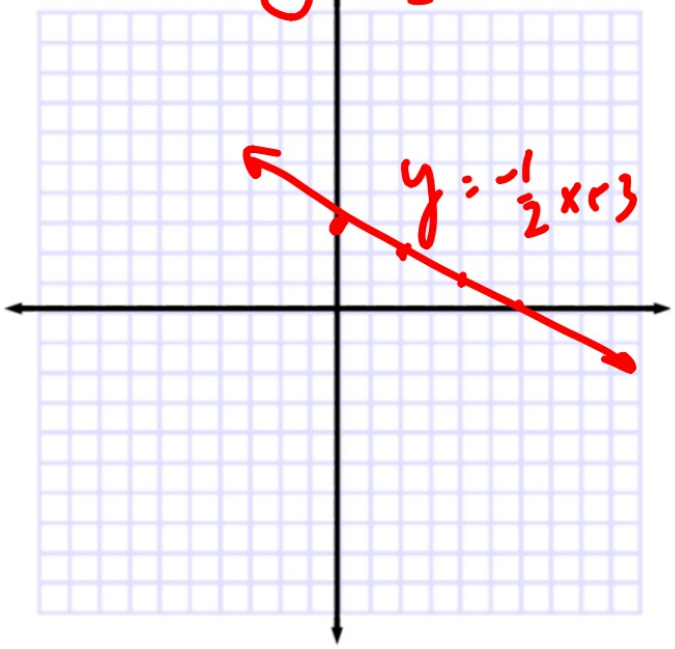
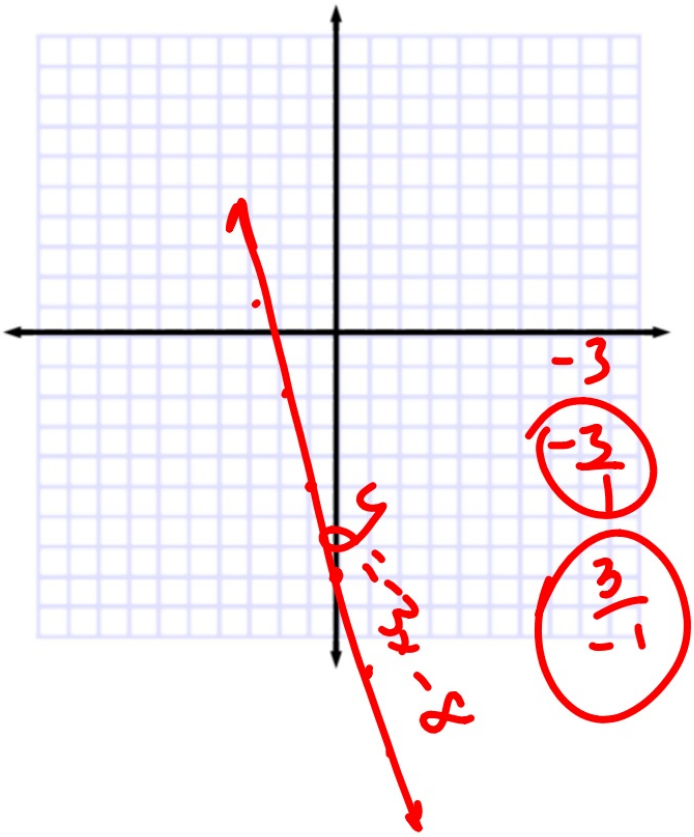
Write an equation of a line in slope intercept form with the given slope and *y*-intercept. Then graph the equation.

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

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



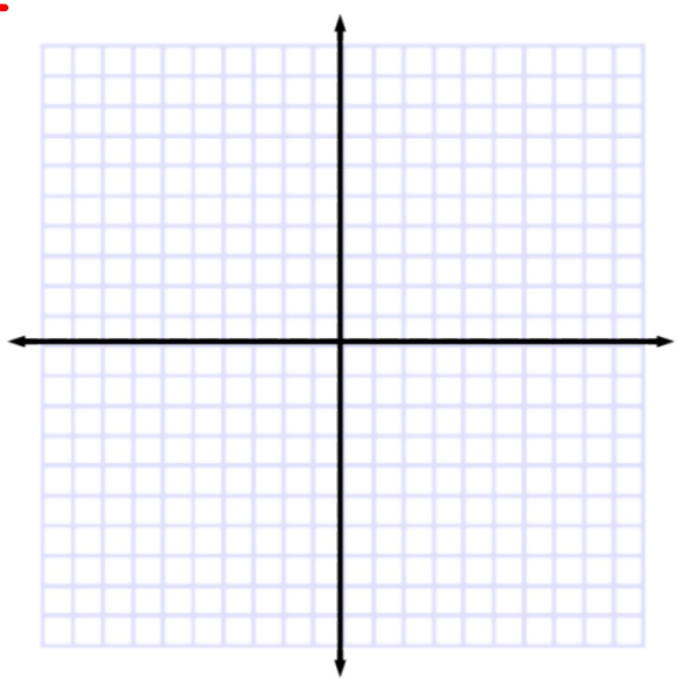
1B. slope: -3, *y*-intercept: -8



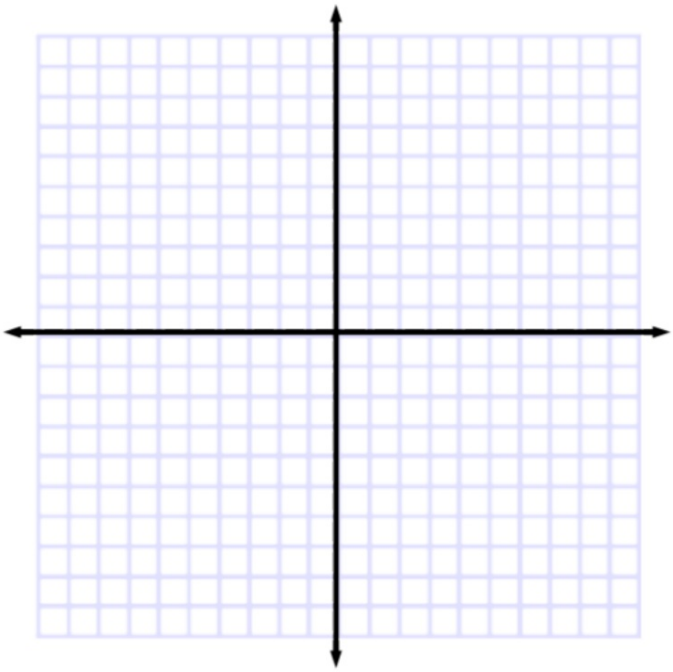
Whiteboards

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



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



$y = mx + b$

Example 2 Graph Linear Equations

Graph $3x + 2y = 6$.

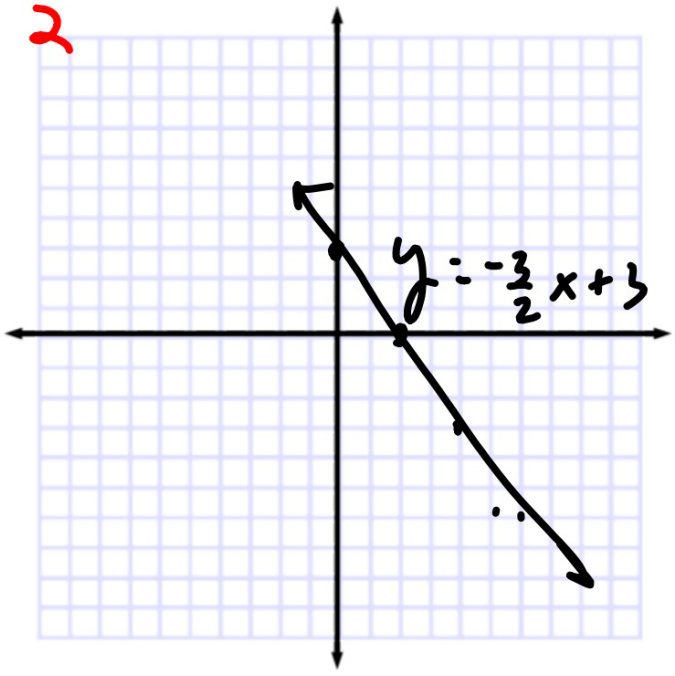
$-3x \quad -3x$

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

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

$\frac{-1.5}{1}$

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



GuidedPractice

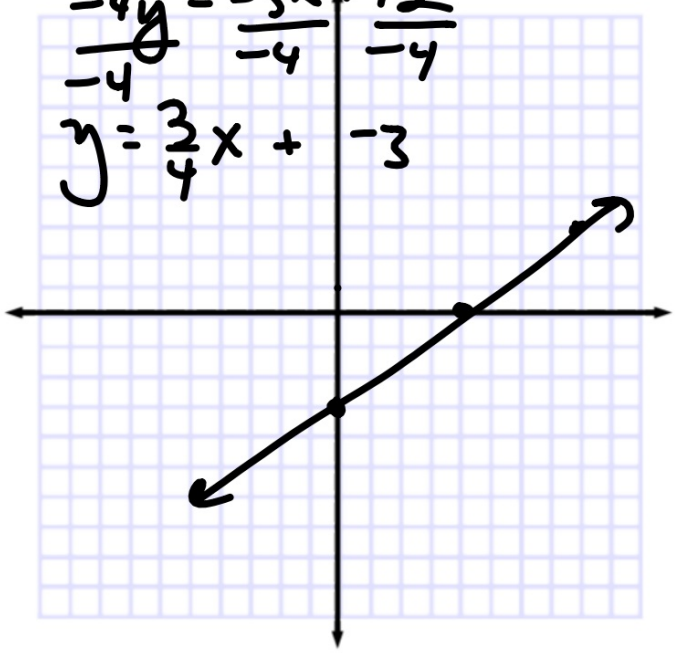
Graph each equation.

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

$-3x \quad -3x$

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

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

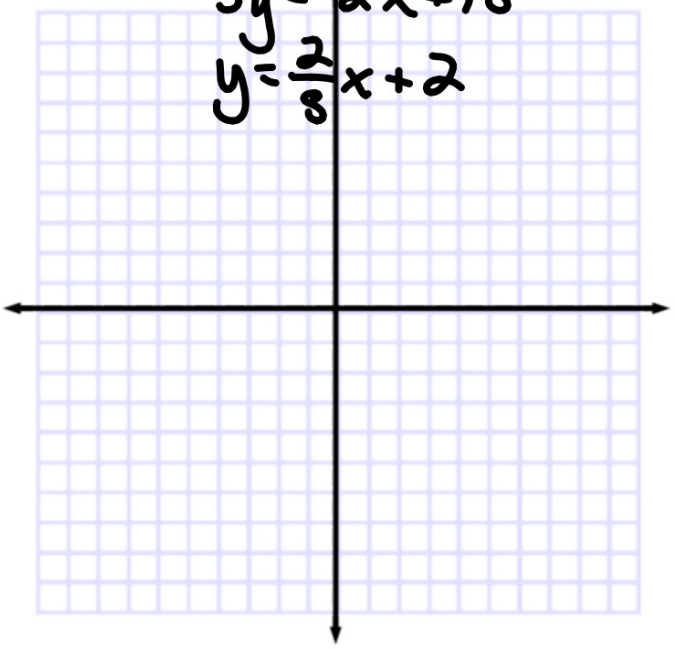


2B. $-2x + 5y = 10$

$+2x \quad +2x$

$5y = 2x + 10$

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



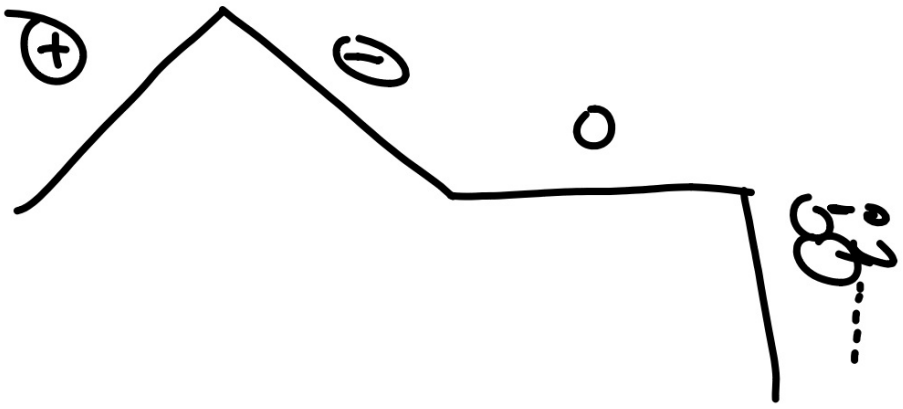
Can he ride...

up hill?

down hill?

horizontally?

up a vertical wall?



$y = mx + B$

Example 3 Graph Linear Equations

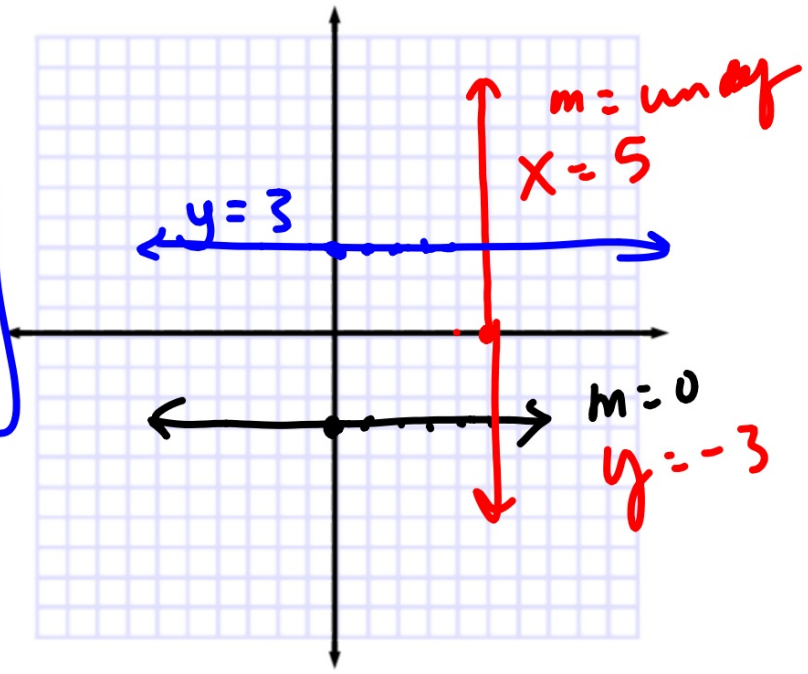
Graph $y = -3$.

$x = 5$

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

$y = \frac{0}{1}x + -3$

$y = mx + B$
$y = \downarrow \quad 3$



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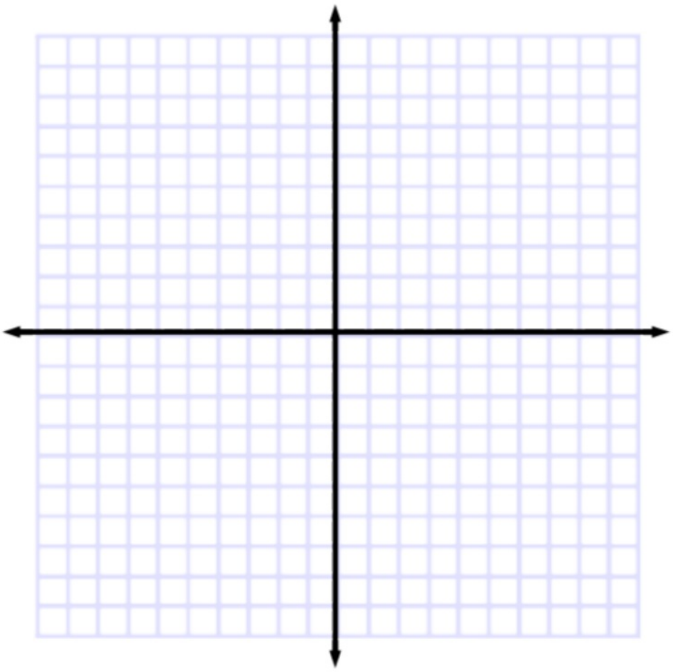
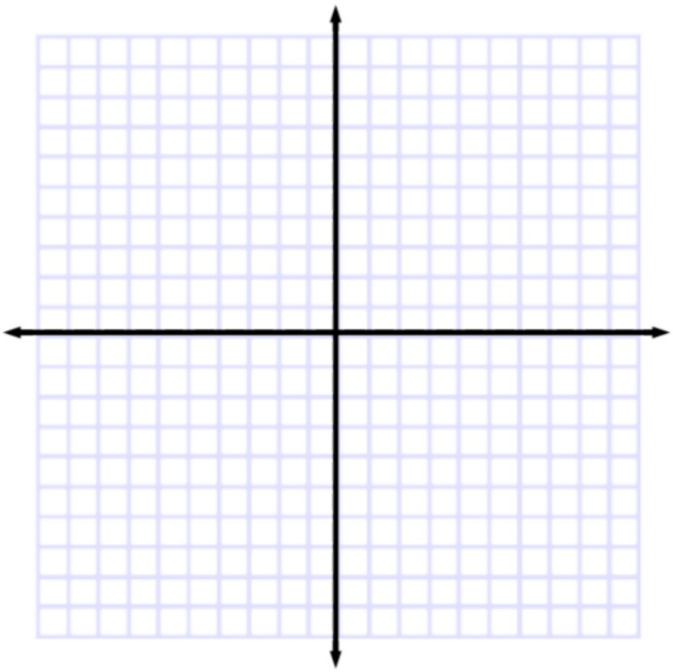
Graph each equation.

3A. $y = 5$



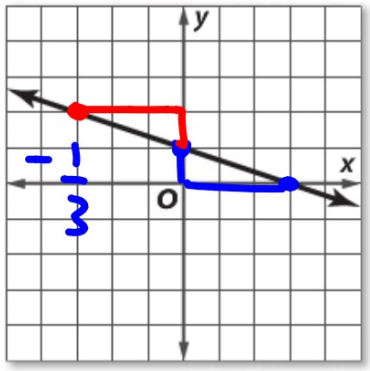
3B. $2y = 1$



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

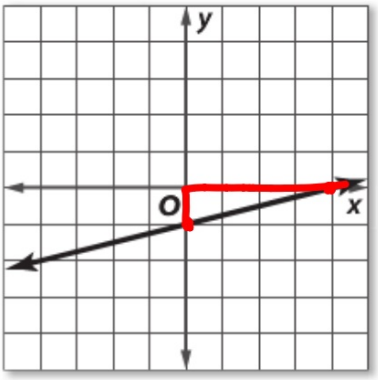
C $y = \frac{1}{3}x + 1$

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

$-\frac{1}{3}$ $\frac{1}{3}$ $\frac{-1}{3}$ $\frac{1}{-3}$

GuidedPractice

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 $y = 4x + 4$