Algebra 1 4.1

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

$y = (\quad)x + b$

rise / run

y-axis

## KeyConcept Slope-Intercept Form

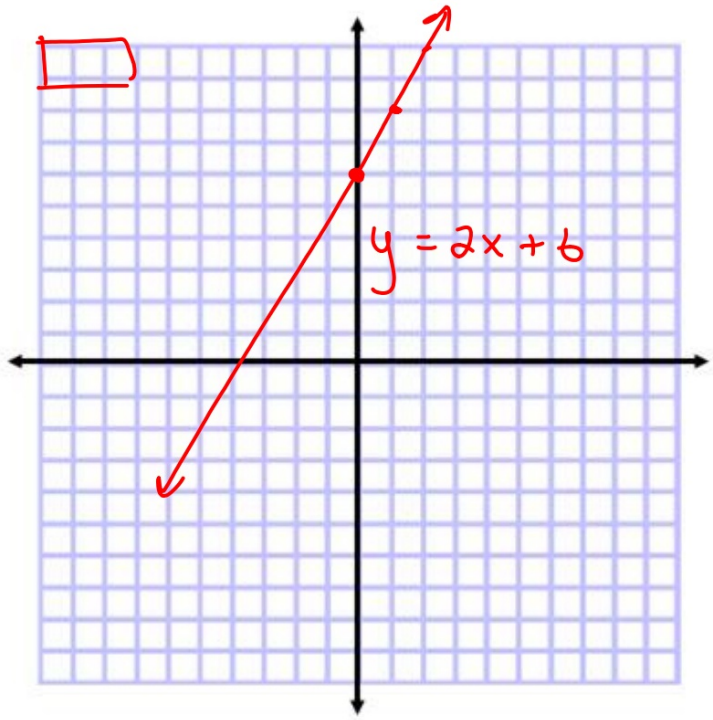
**Words** The slope-intercept form of a linear equation is $y = mx + b$, where $m$ is is the $y$-intercept.

**Example** $y = mx + b$

$y = 2x + 6$

slope — y-in

$y = 2x + 0$



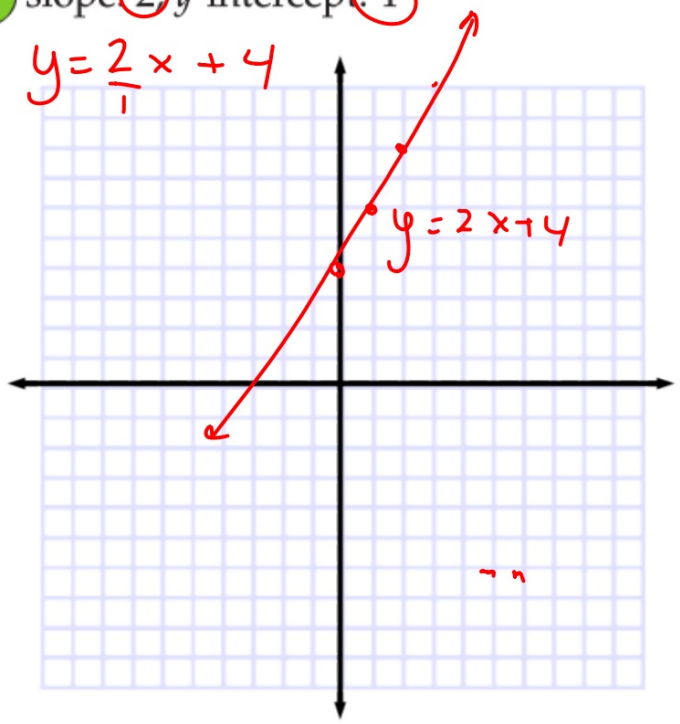
Whiteboards

$y = mx + B$

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

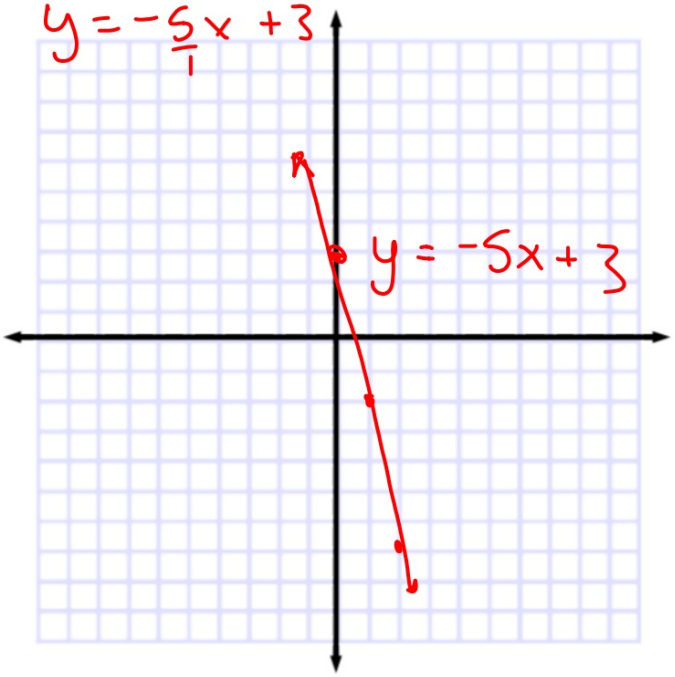
**1** slope: 2, *y*-intercept: 4

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




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

$y = -\frac{5}{1}x + 3$



$y = mx + B$

## Example 2 Graph Linear Equations

**Graph $3x + 2y = 6$.**

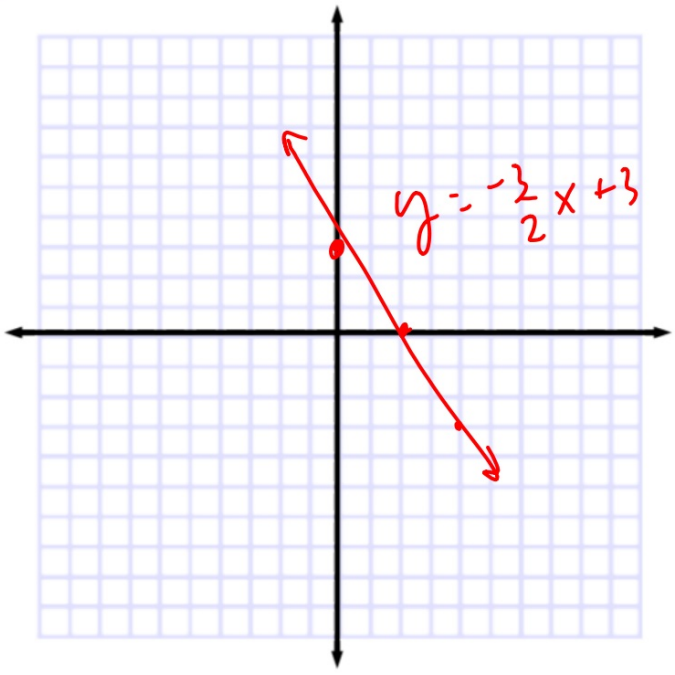
$-3x \quad -3x$

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

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

$\frac{-3}{2}$

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



**GuidedPractice**

$y = mx + b$

**Graph each equation.**

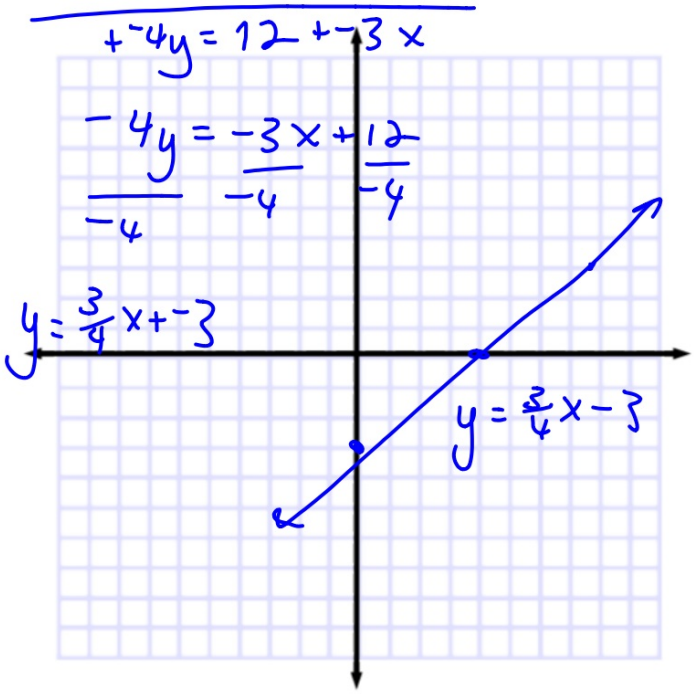
**2A.** $3x + -4y = 12$

$-3x \quad -3x$

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

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

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

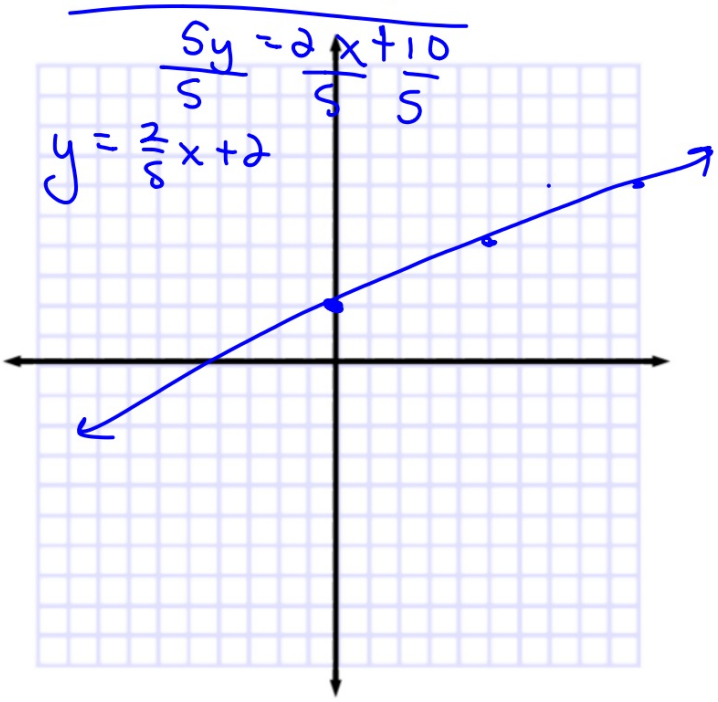



**2B.** $-2x + 5y = 10$

$+2x \quad +2x$

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

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



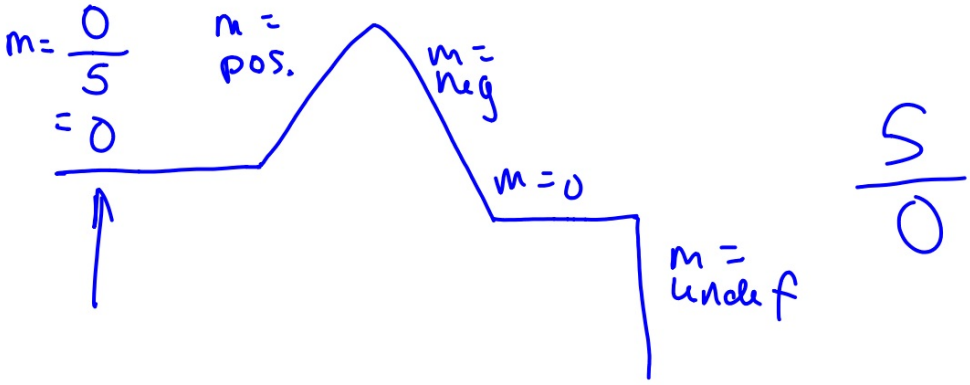
Can he ride...

up hill?

down hill?

horizontally? $m = 0$

up a vertical wall? $m =$ undef




$\frac{5}{0}$

x =
y =

## Example 3 Graph Linear Equations

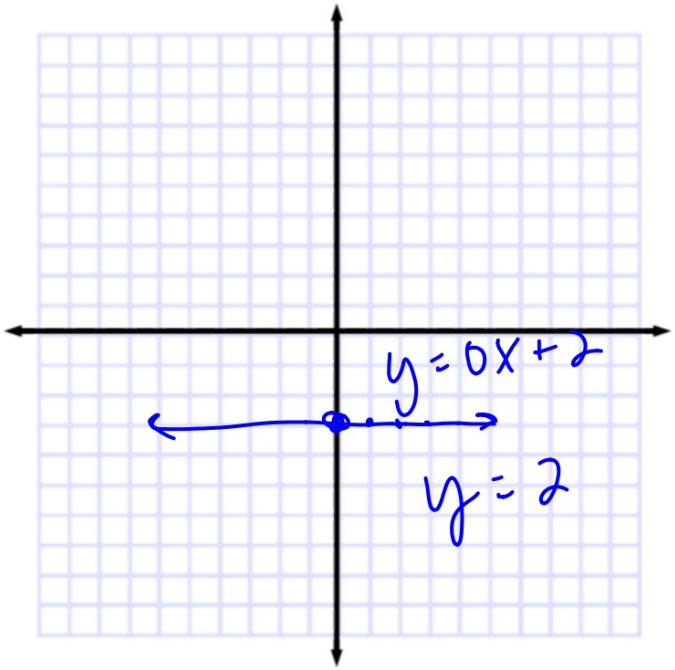
**Graph $y = -3$.**

$y = mx + B$

$y = 0x - 3$

$y = 2$

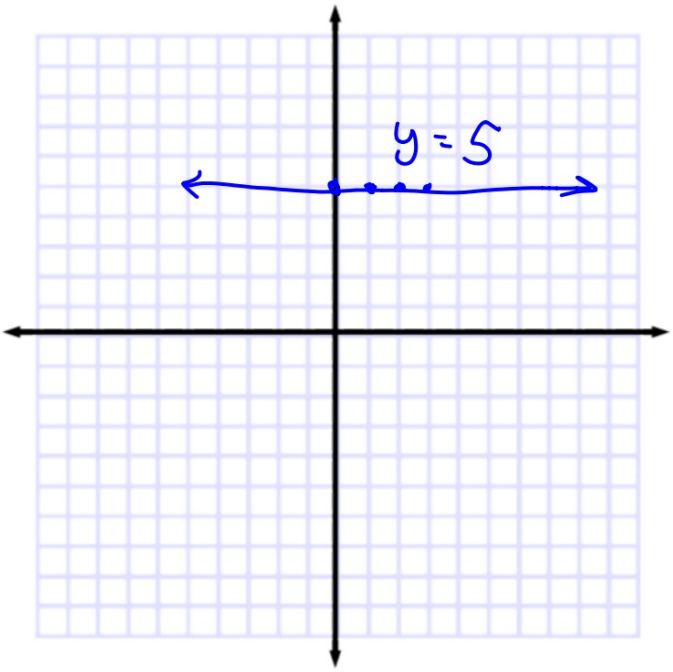
Bicycles: constant slope
y = constant describes vertical distance (x,y)
so y= 2 would be always "up 2" etc.



## GuidedPractice

**Graph each equation.**

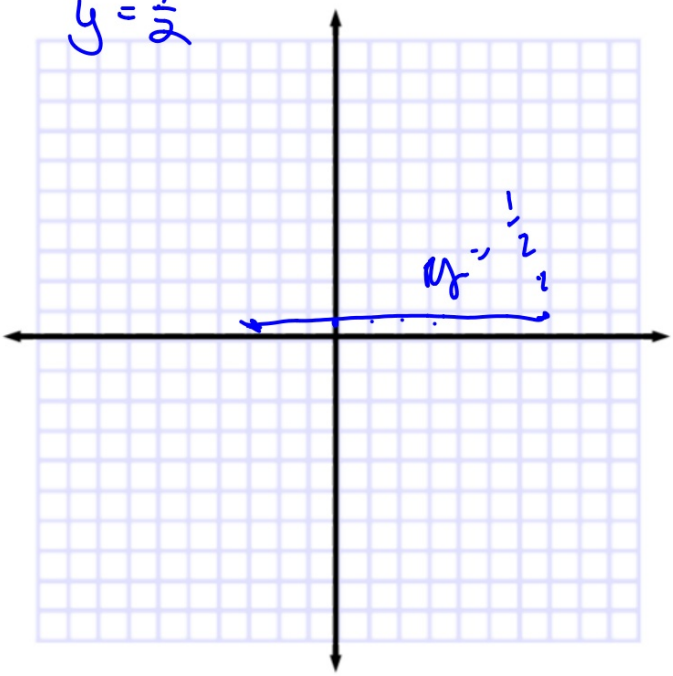
**3A.** $y = 5$




**3B.** $2y = 1$

$\frac{2y}{2} = \frac{1}{2}$

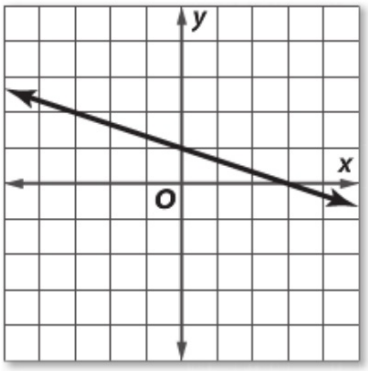
$y = \frac{1}{2}$



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** $y = -3x + 1$

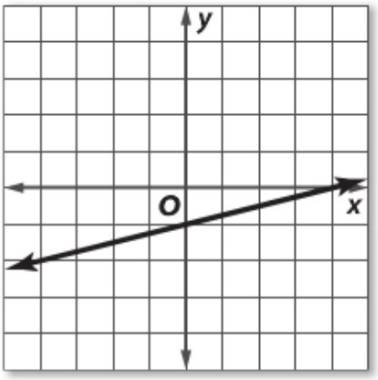
**B** $y = -3x + 3$

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

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

## 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** $y = 4x + 4$