Algebra 1 4.1

Write and graph linear equations in slope-intercept form. $y = mx + b$

Model data with equations in slope-intercept form

linear

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

y-intercept b

y=mx+b

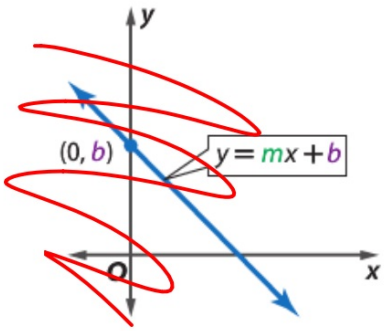
constant function

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.



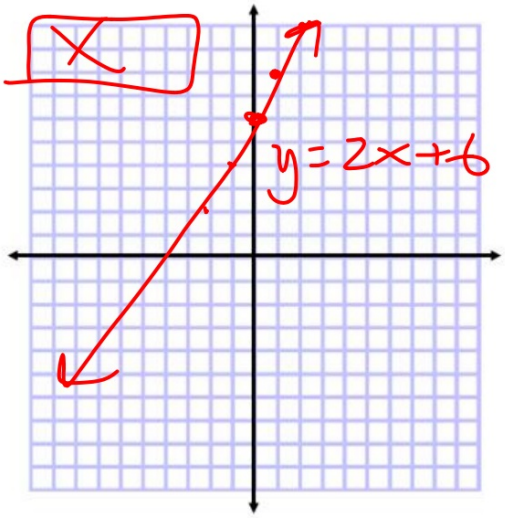
Example

$y = mx + b$

$y = 2x + 6$

slo

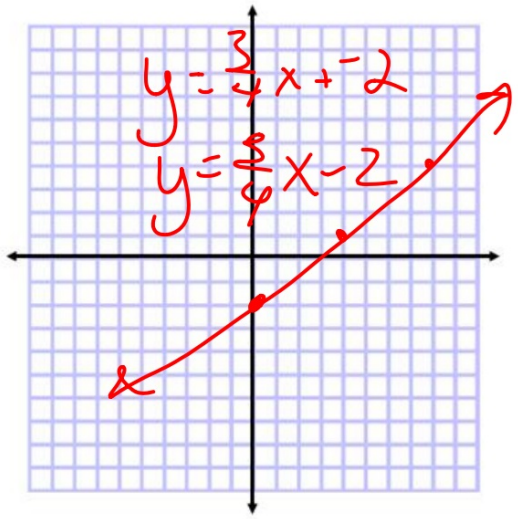
$\frac{-2}{-1}$



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

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.



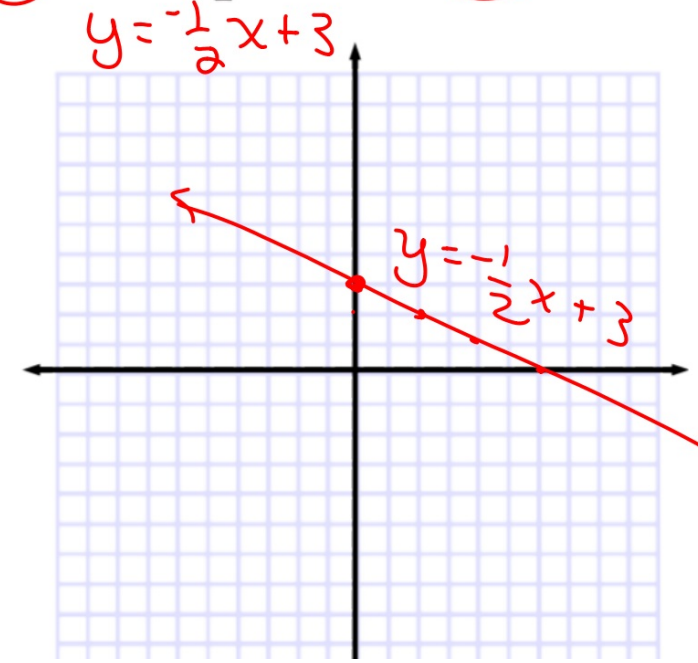
Where should I start?...

GuidedPractice

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

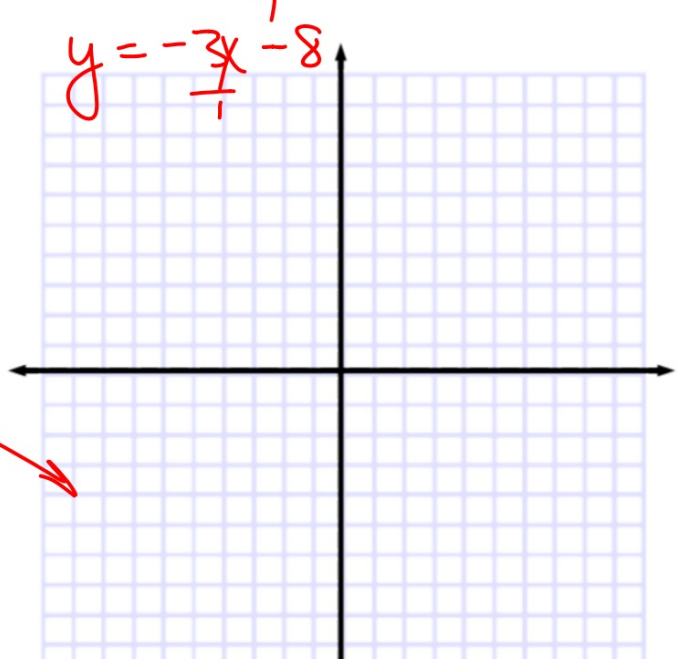
1A. slope: $-\frac{1}{2}$, y-intercept: 3

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



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

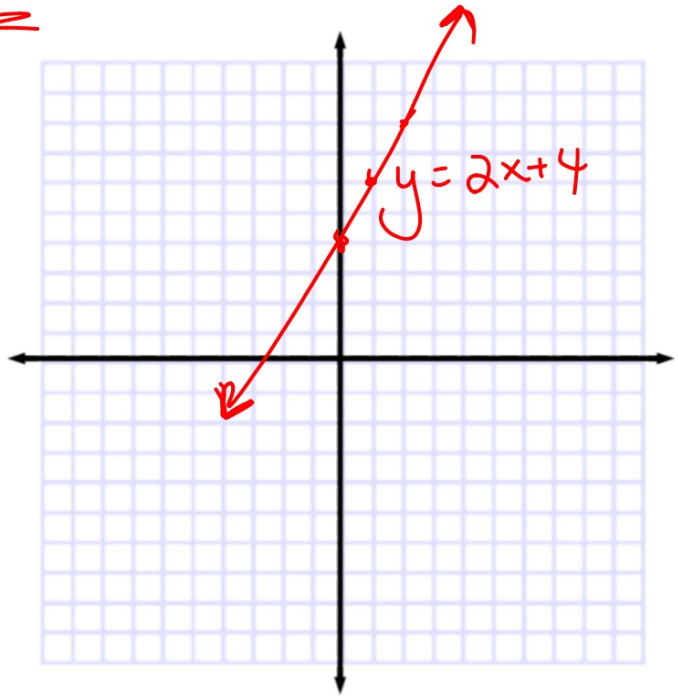
$y = -\frac{3}{1}x - 8$



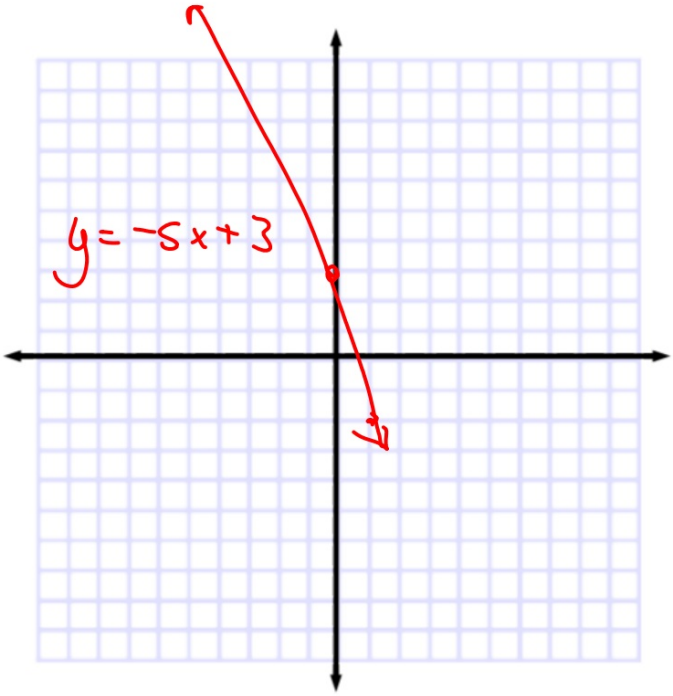
Whiteboards

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

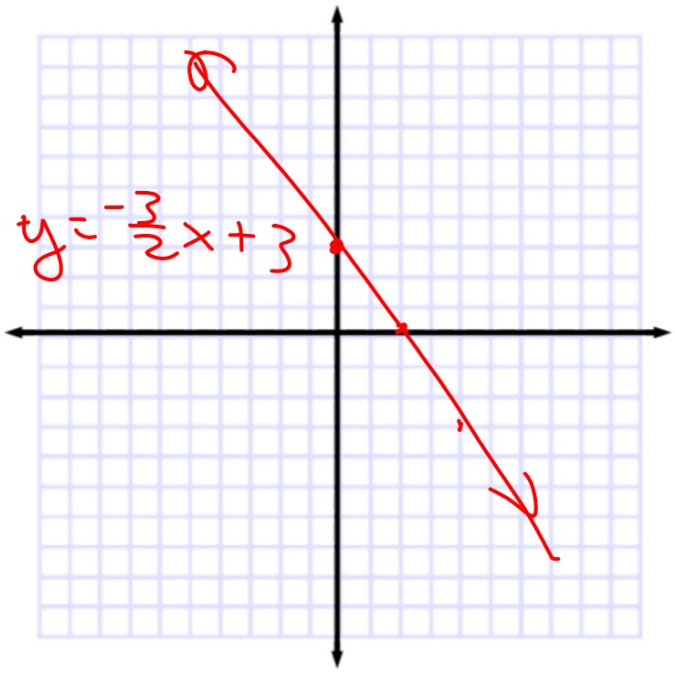
Graph $3x + 2y = 6$.

$-3x \quad -3x$

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

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

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



GuidedPractice

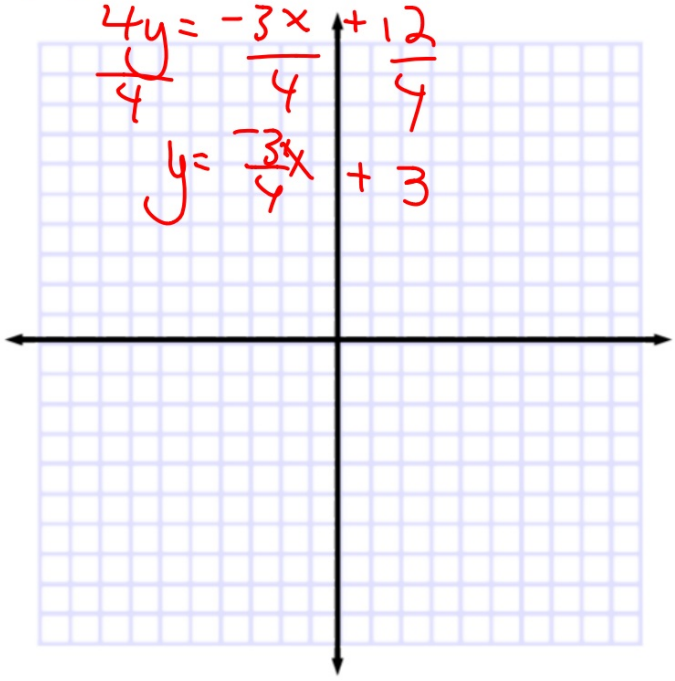
Graph each equation.

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

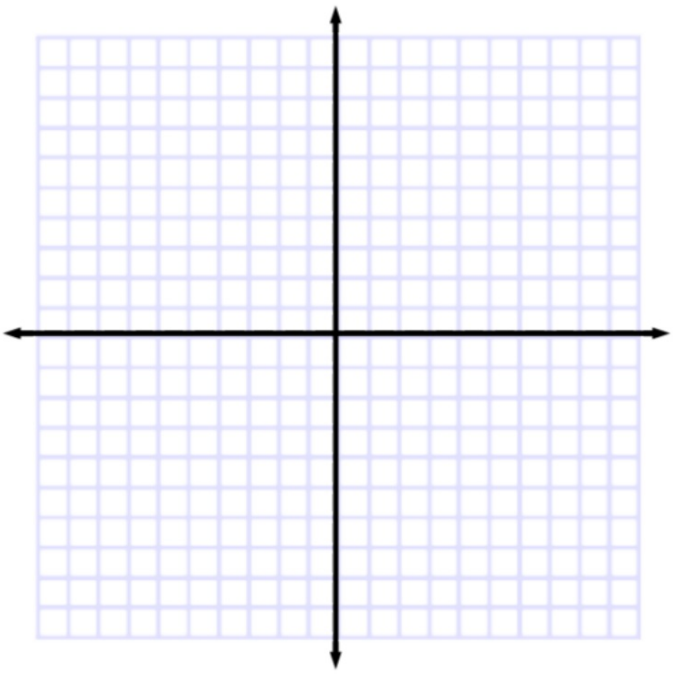
$-3x \quad -3x$

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

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



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



Can he ride...

up hill?

down hill?

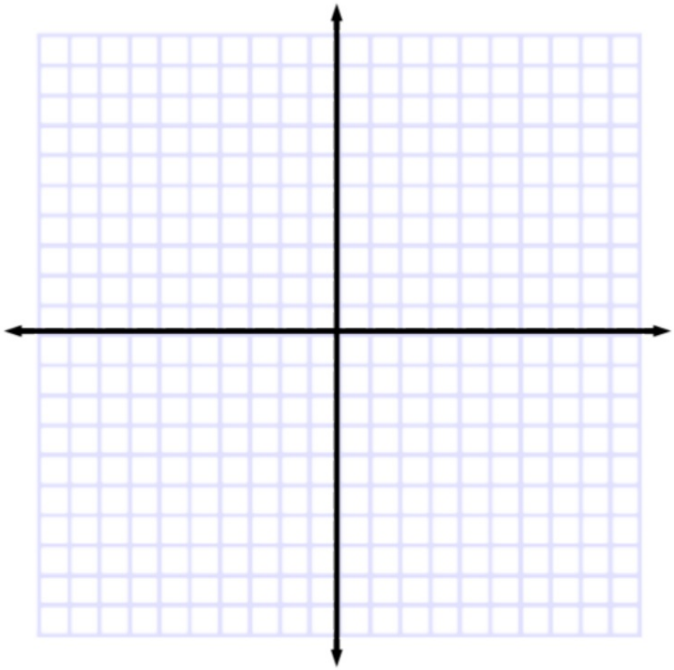
horizontally?

up a vertical wall?

Example 3 Graph Linear Equations

Graph $y = -3$.

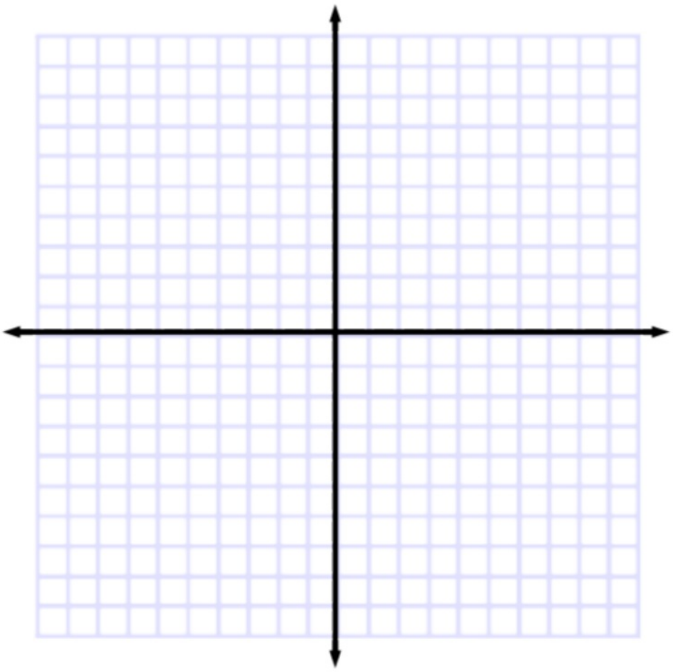
Bicycles: constant slope
y = constant describes vertical distance (x,y)
so y= 2 would be always "up 2" etc.



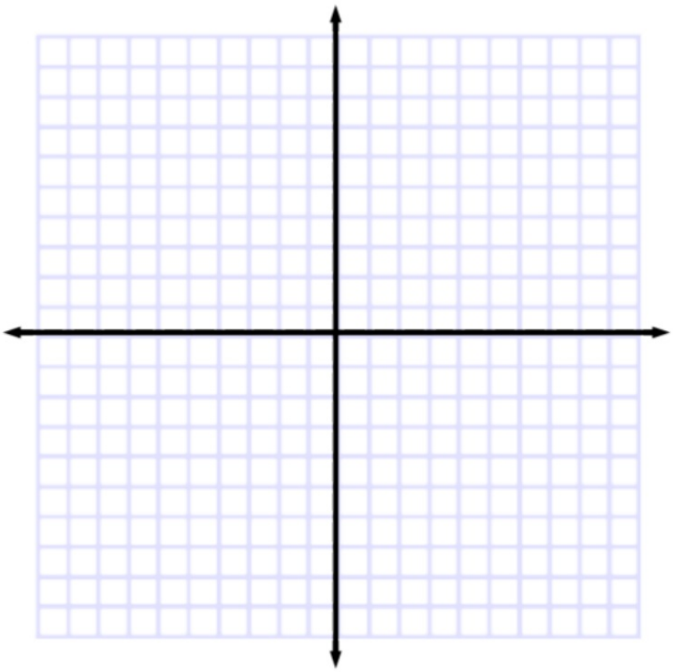
GuidedPractice

Graph each equation.

3A. $y = 5$



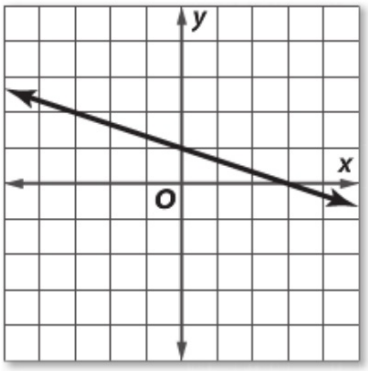
3B. $2y = 1$



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 $y = -3x + 1$

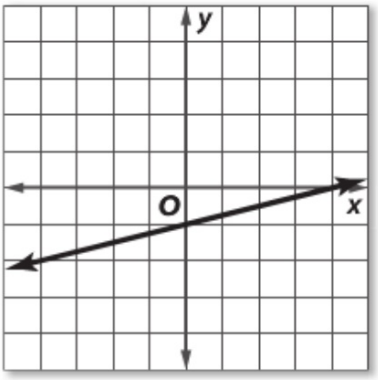
B $y = -3x + 3$

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 $y = 4x + 4$