

Algebra 1 4.1

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

linear - graph is a line

slope $m = \frac{\text{rise}}{\text{run}}$ cross y-axis

y-intercept

$y = mx + b$

constant function

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

↑ ↑

Song

Whiteboards

KeyConcept Slope-Intercept Form



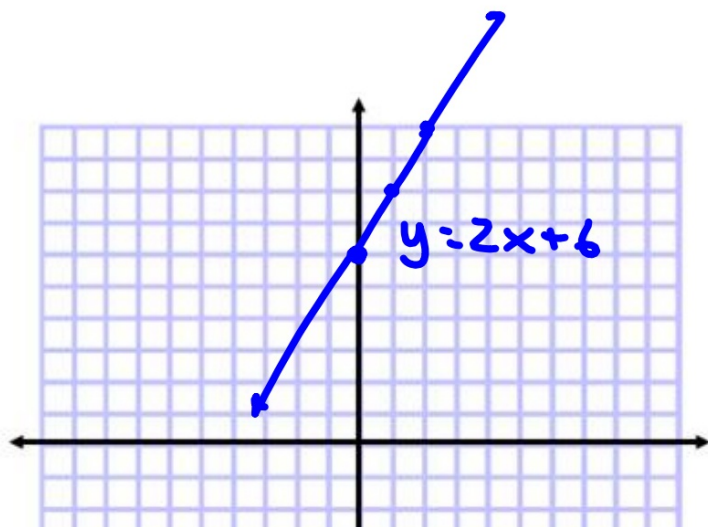
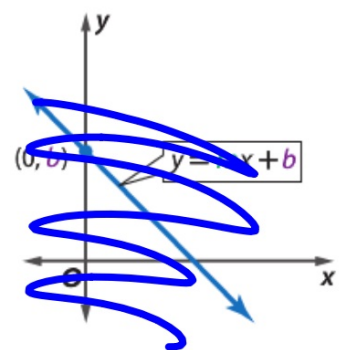
Words

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 $\uparrow$ y -intercept



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

$$y = 2x + 4$$

2. slope: $-\frac{5}{7}$, y -intercept: 3

$$\frac{-5}{-1}$$

$$y = -5x + 3$$

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

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

$$y = mx + B$$

Example 2 Graph Linear Equations

Graph $3x + 2y = 6$.

$$-3x \quad -3x$$

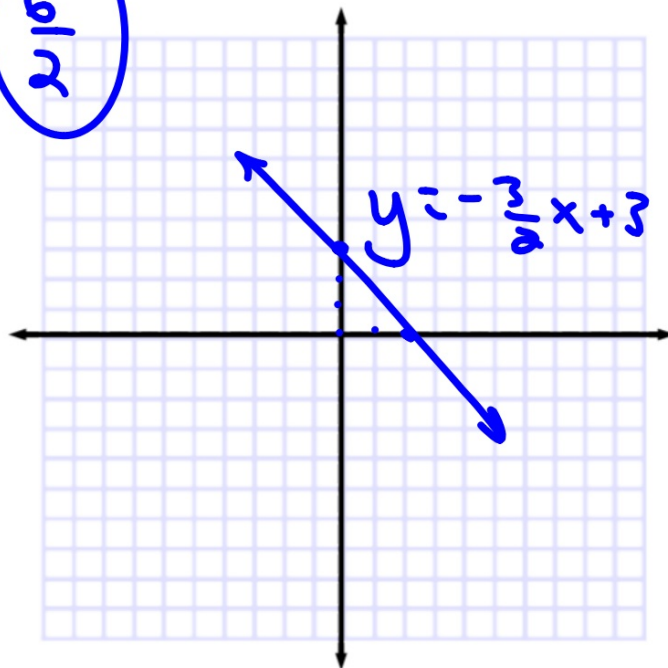
$$\frac{2y}{2} = \frac{-3x}{2} - \frac{6}{2}$$

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

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

Find slope and y-int

Hint: $y = mx + b$

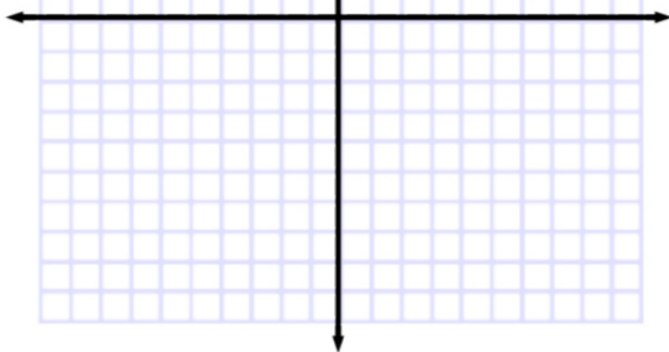


Guided Practice

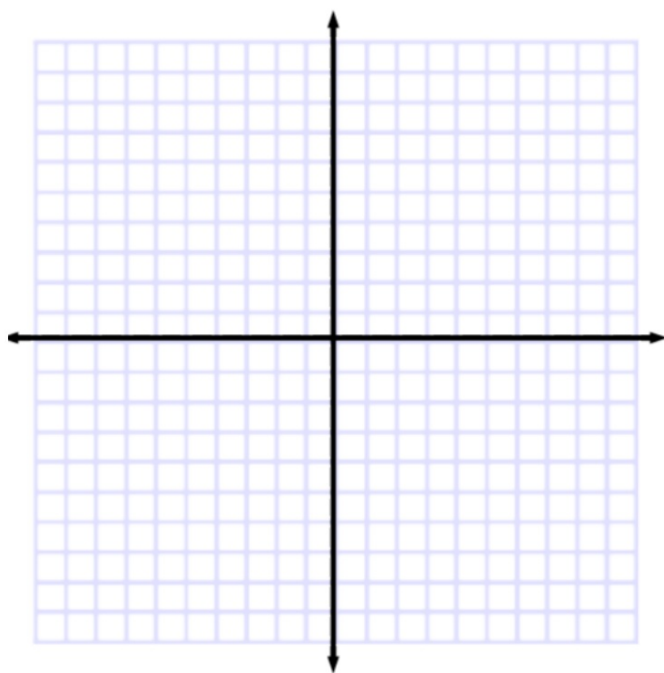
Graph each equation.

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

$$\begin{array}{r} \div \quad \frac{-3x}{-4} \\ -4y = \frac{-3x}{-4} + \frac{12}{-4} \\ y = \frac{3}{4}x - 3 \end{array}$$



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





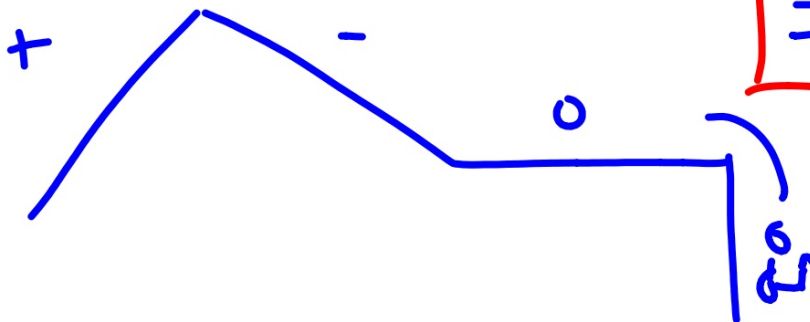
Can he ride...

- ☒ up hill?
- ☒ down hill?
- ☐ horizontally?
- up a vertical wall?

not defined

$$\frac{-6}{0}$$

No...
:-

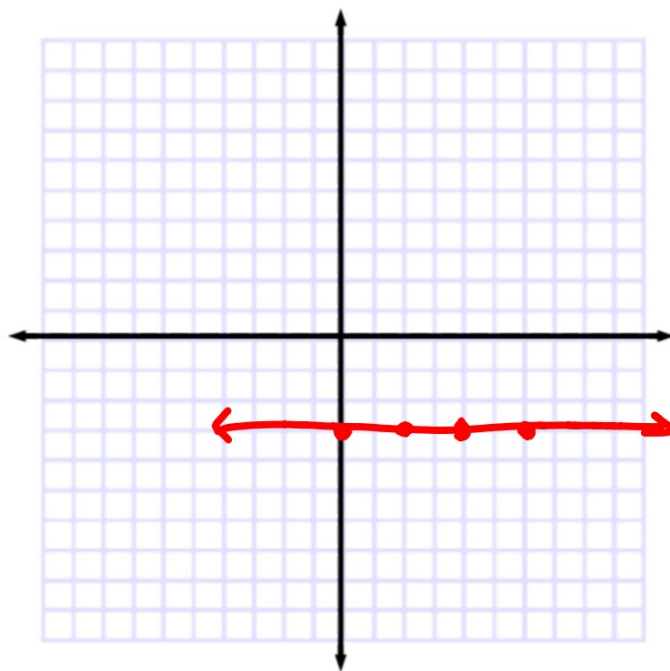


$$y = mx + B$$

Example 3 Graph Linear Equations

Graph $y = -3$.

4	-3
2	-3
6	-3
0	-3

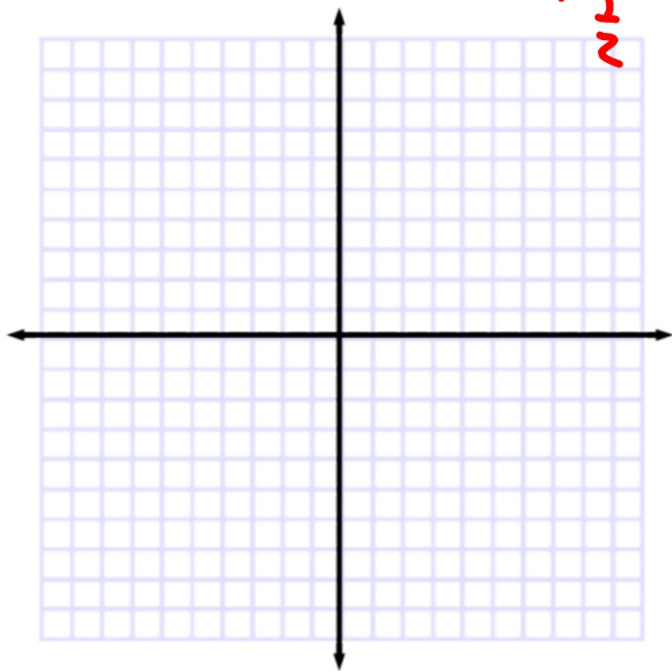


Bicycles: constant slope
 $y = \text{constant}$ describes vertical distance (x,y)
so $y = 2$ would be always "up 2" etc.

Guided Practice

Graph each equation.

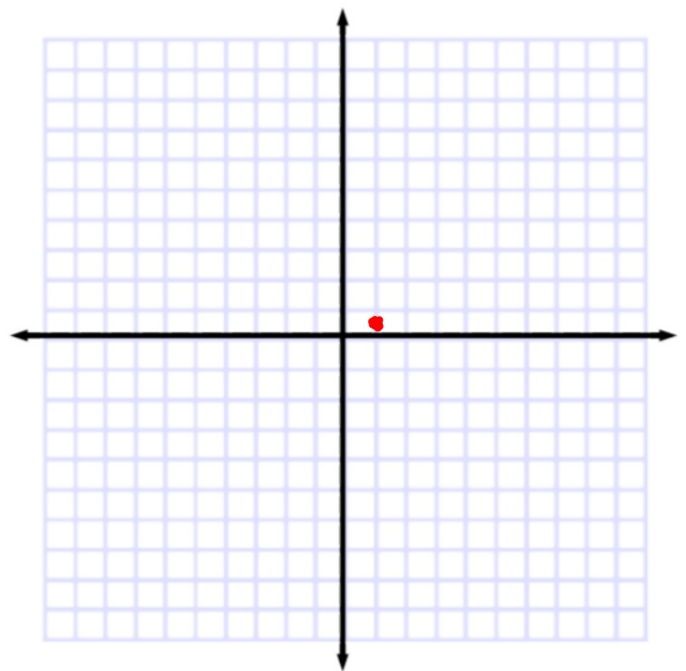
3A. $y = 5$



Handwritten red notes for problem 3A:

$$\begin{array}{|c} 1 \\ \hline \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \end{array}$$

3B. $\frac{2y}{2} = \frac{1}{2}$ $y = \frac{1}{2}$



What do we need to know?

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



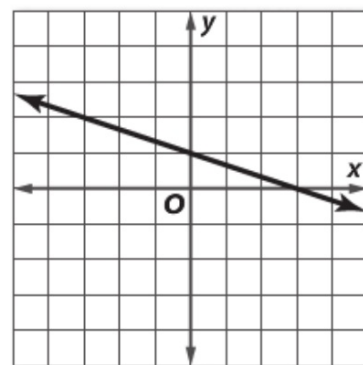
Which of the following is an equation in slope-intercept form for the line shown?

A $y = -3x + 1$

B $y = -3x + 3$

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

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



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 $y = 4x + 4$

