Algebra 1 4.1

Write and graph linear equations in slope-intercept form.

Model data with equations in slope-intercept form

linear forms a line

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

y-intercept $b =$ cross y-axis

$y = mx + b$

$y = 3x + 5$ (m, b)

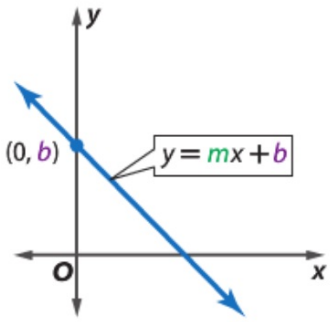
constant function

Song

Whiteboards

KeyConcept Slope-Intercept Form

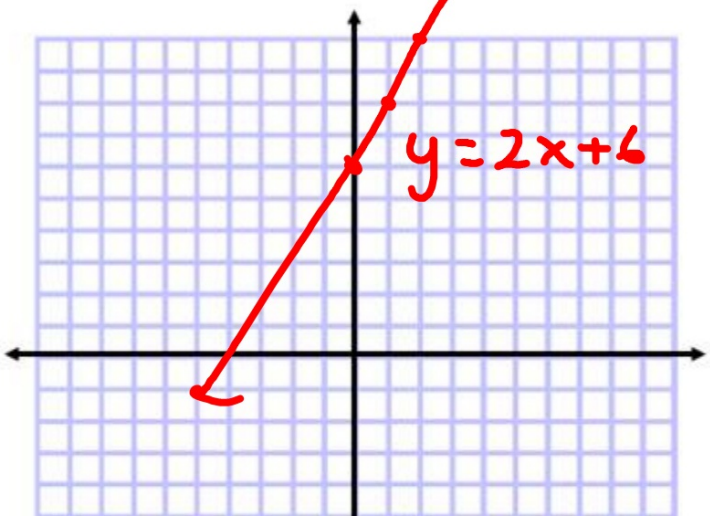
Words The slope-intercept form of a linear equation is $y = mx + b$, where m is the slope and b is the y-intercept.



Example $y = mx + b$

$y = 2x + 6$

$\frac{2}{1}$

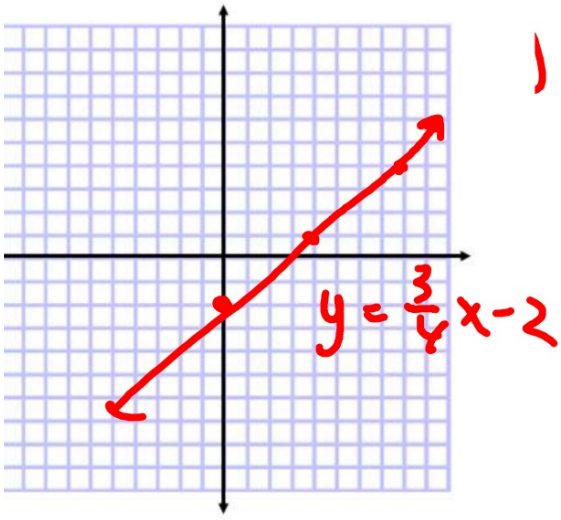


Example 1 Write and Graph an Equation

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.

$= mx + B$

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



Where should I start?...

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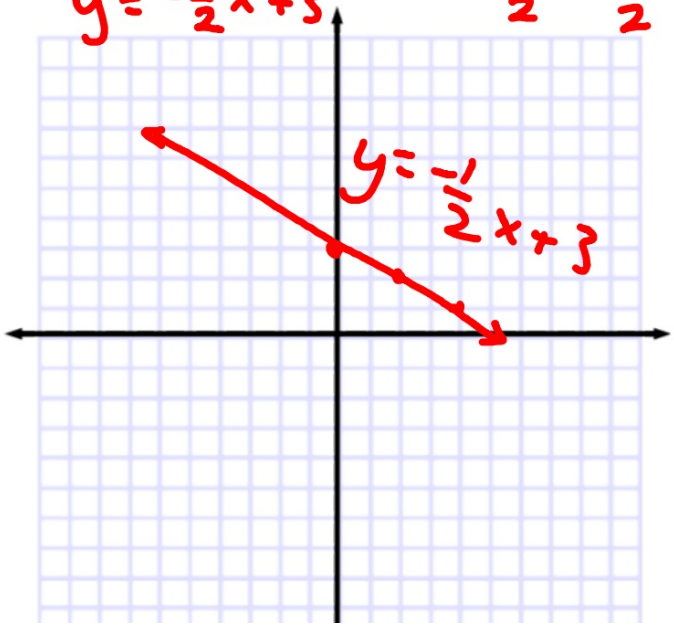
Write an equation of a line in slope intercept form with the given slope and *y*-intercept. Then graph the equation.

$y = -3x - 8$

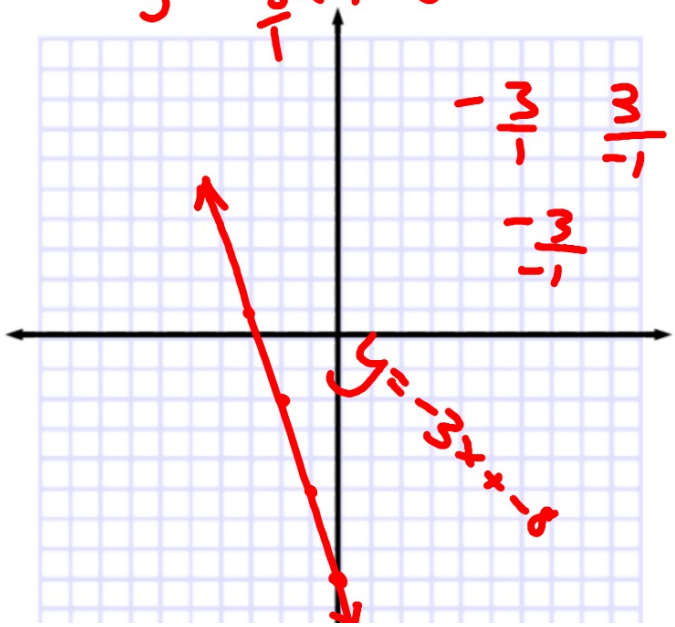
1A. slope: $-\frac{1}{2}$, *y*-intercept: 3

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



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

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



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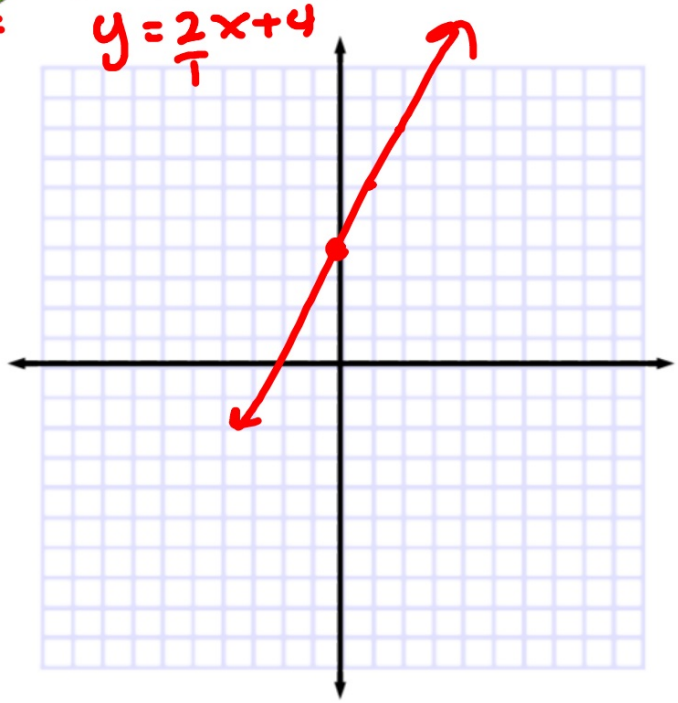
Write an equation of a line in slope-intercept form with the given slope and *y*-intercept. Then graph the equation.

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

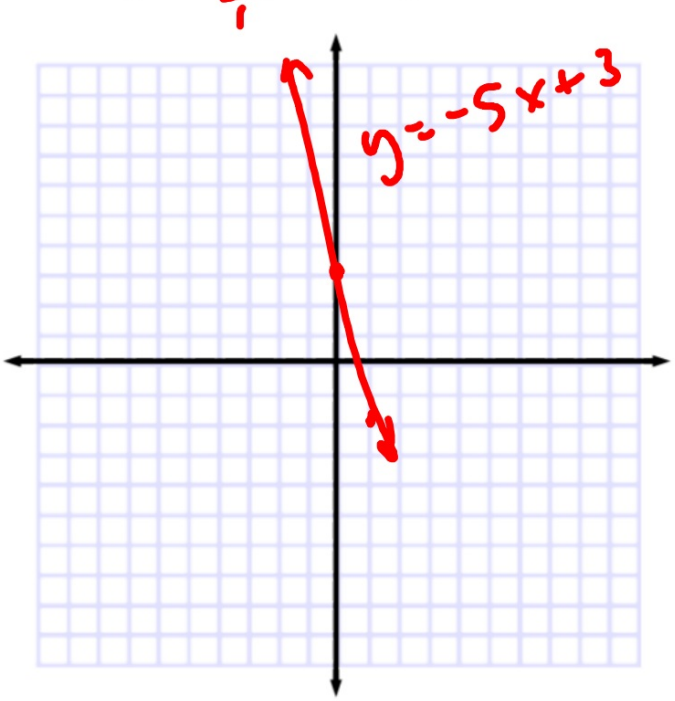
$y = \frac{2}{1}x + 4$



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

$\frac{-5}{1}$

$y = -5x + 3$



$y = mx + B$

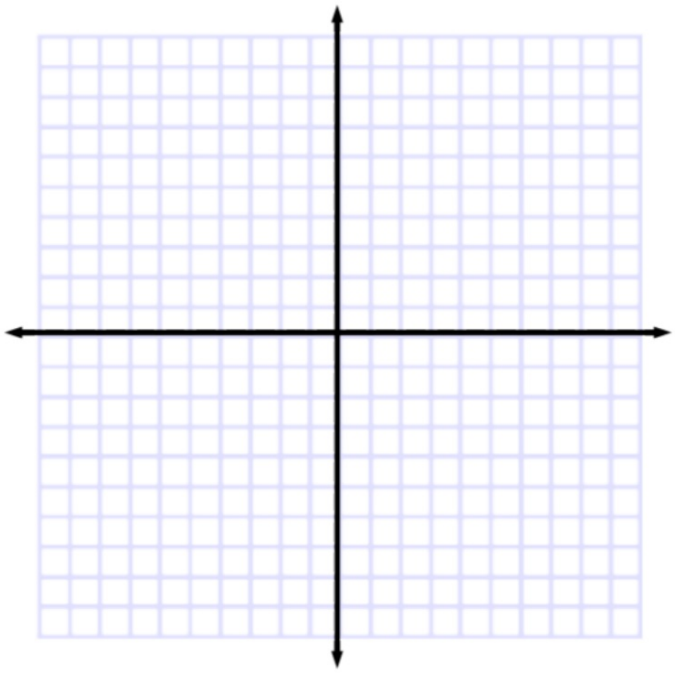
Example 2 Graph Linear Equations

Graph $3x + 2y = 6$.

$-3x \quad -3x$

$2y = -3x + 6$

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



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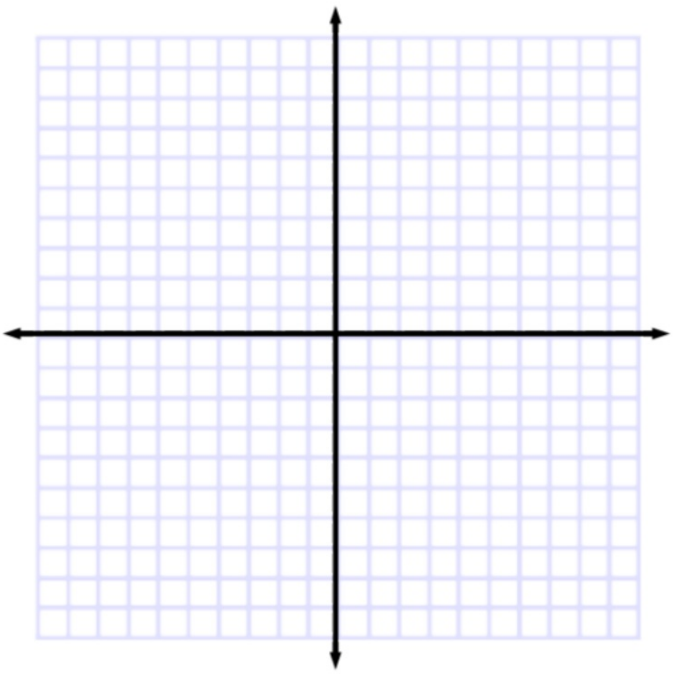
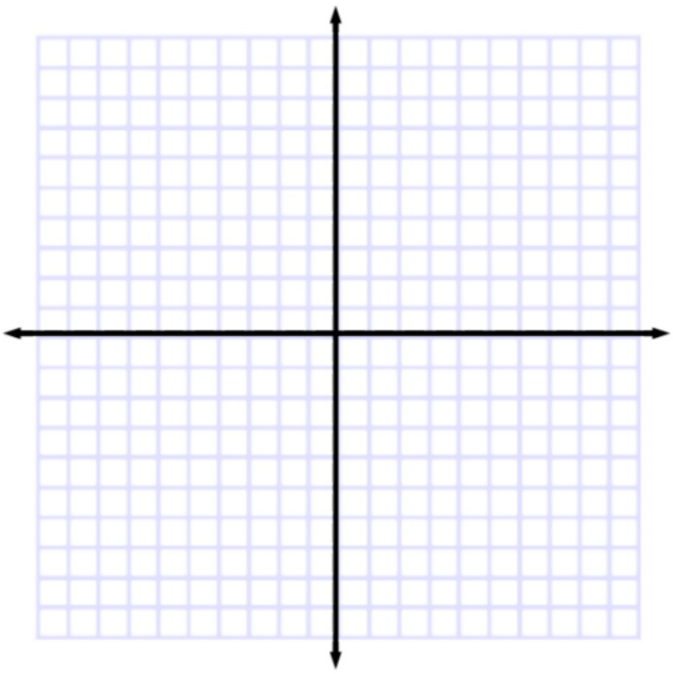
Graph each equation.

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



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



Can he ride...

up hill?

down hill?

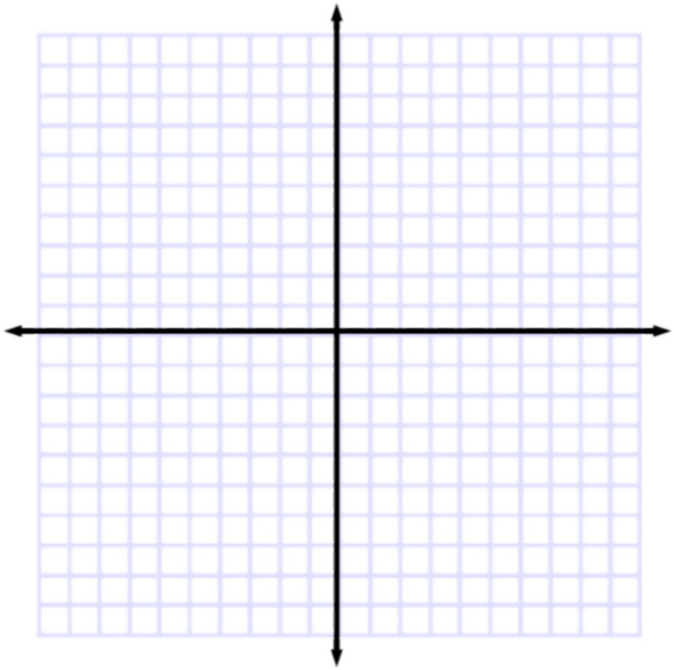
horizontally?

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.



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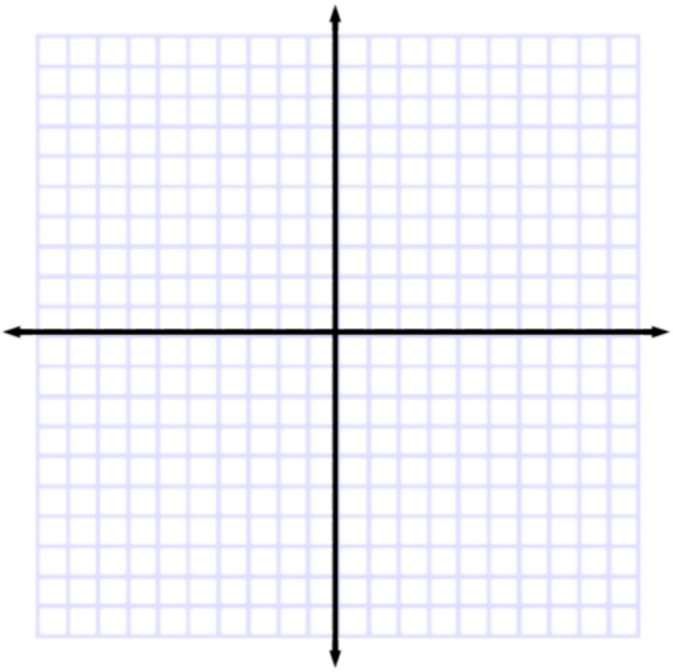
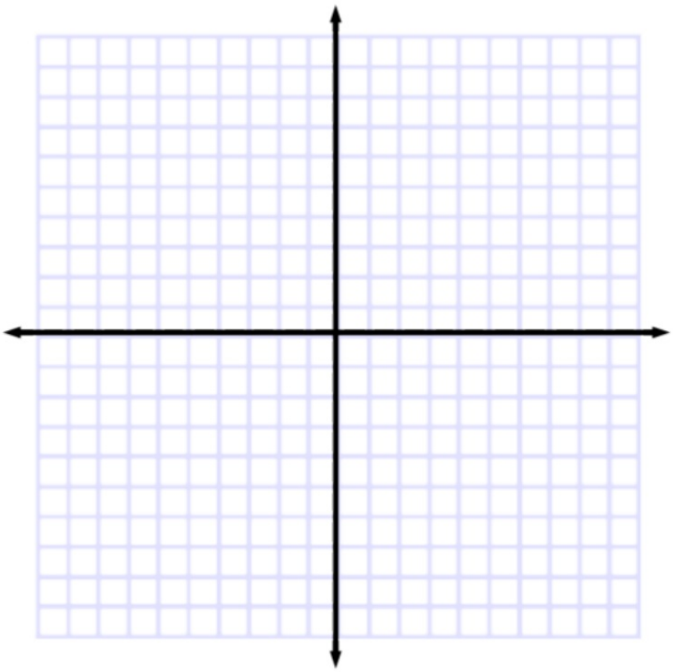
Graph each equation.

3A. $y = 5$



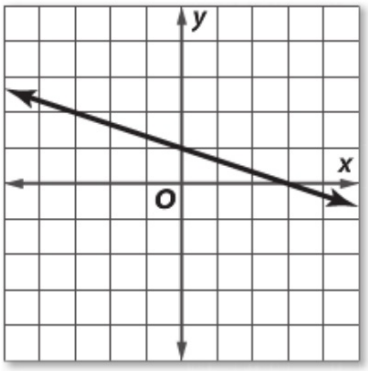
3B. $2y = 1$



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 $y = -3x + 1$

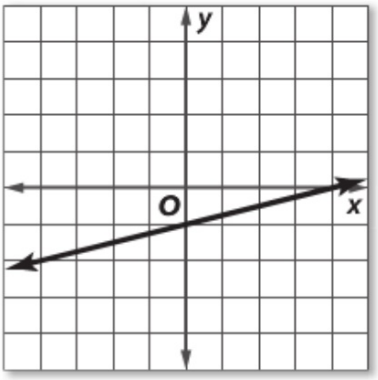
B $y = -3x + 3$

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

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

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 $y = 4x + 4$