

Section 5.1 Writing Linear Equations in Slope Intercept Form

We can write the equation of a line simply by knowing its slope and y-intercept and the slope-intercept form of a line.

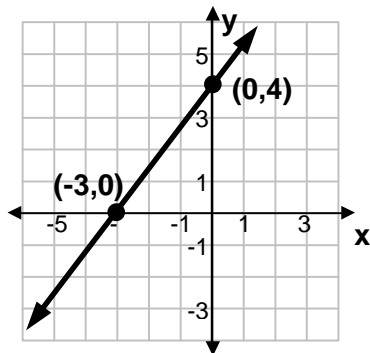
Slope Intercept Form: $y = mx + b$
 $m = \text{slope}$
 $b = \text{y-intercept}$

Example: Write the equation of the line with a slope of 3 and a y-intercept at -4 .

You are given $m = 3$ and $b = -4$. Therefore, by plugging those values into $y = mx + b$ you get: $y = 3x - 4$

To write the equation of a line from a graph, simply calculate the slope by picking any two points and using slope = rise/run. Next, find the y-intercept by looking to see where the line crosses the y-axis. Plug the slope and the y-intercept into the slope intercept form equation $y = mx + b$.

Example: Given the graph, write an equation for the line in slope intercept form.



$$\text{Slope} = \frac{\text{rise}}{\text{run}} = \frac{4}{3}$$

$$\text{y-intercept} = 4$$

$$\text{Answer: } y = \frac{4}{3}x + 4$$

Word Problems Using Slope Intercept Form

To solve word problems using slope intercept form, just remember the y-intercept is how much you start with and the slope is the rate of change.

Example: Write an equation for the following situation. 2High Cellular charges \$22 per month plus 10¢ per minute.

*Let $x = \text{minutes of use}$
Let $y = \text{total monthly bill}$
 $y = mx + b$

y-intercept = $b = \$22$
slope = $m = 10\text{¢} = 0.10$
Answer: $y = 0.10x + 22$

**Note: You should always have x represent the independent variable such as time.*