

We've seen functions like this before:

$$f(x) = 4x + 2, \quad g(n) = \frac{1}{2}n - 3, \quad \text{etc...}$$

Generally, slope-intercept form is:

$$y = mx + b$$

This is "Slope-intercept form" because:

★ m is the slope of the line ★
 ★ b is the y -intercept.

Ex: A linear function has a slope of $\frac{4}{3}$ and a y -intercept of -4 . Write an equation for this function.

$$m = \frac{4}{3}, \quad b = -4, \quad \text{so...}$$

$$y = mx + b$$

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

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

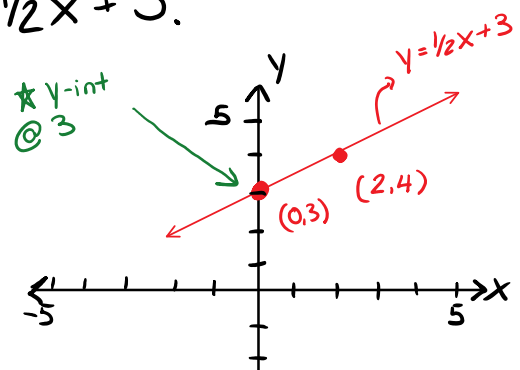
Ex: Graph the function $y = \frac{1}{2}x + 3$.

$$m = \frac{1}{2} \begin{matrix} \rightsquigarrow \text{rise} \\ \rightsquigarrow \text{run} \end{matrix}$$

$$b = 3$$

① Plot the y -int.

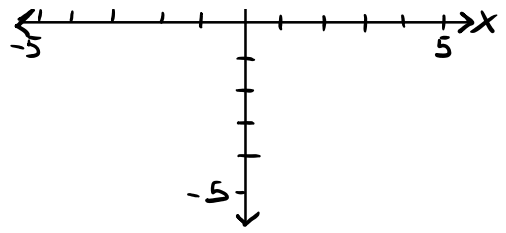
② From there, apply the slope.



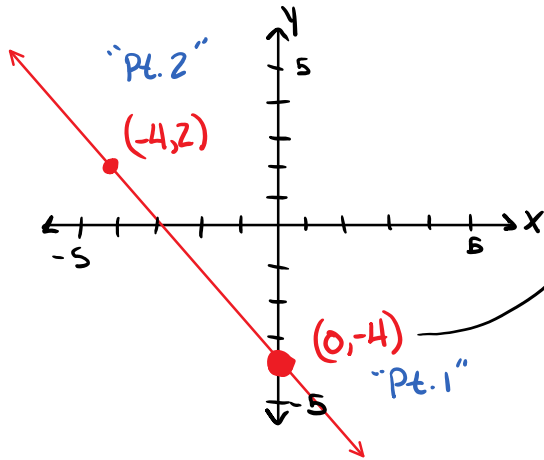
$$b = 3$$

so y-intercept is at 3.

apply the slope.



Ex: Determine the equation of the following line:



y-int is -4

So, $b = -4$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{(2) - (-4)}{(-4) - (0)} = \frac{6}{-4} = -\frac{3}{2}$$

$$y = mx + b$$

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

Ex: The school holds a dance. The DJ costs \$300 and the school sells tickets for \$5/person.

(i) Write an equation for the profit (P) in dollars:

Profit = Income - Expenses... \downarrow cost of DJ

$$P = 5n - 300$$

\uparrow number of students

(slope intercept form).

(ii) If 123 people bought tickets, what's the profit?

$n = 123$ so...

$$P = 5n - 300$$

$$P = 5(123) - 300$$

$$P = 615 - 300$$

$$P = 315$$

\Rightarrow Profit of \$315.

