

6.4 Finding the Equation of a line
in the form $y = mx + b$

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\uparrow \uparrow
 slope y-intercept

examples:

① slope = $-\frac{1}{2}$
y-intercept = 5

$$y = -\frac{1}{2}x + 5$$

② slope = $\frac{2}{3}$ and the line passes
through the point $(0, -1)$

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

③ A line that passes through
points $(2, 5)$ and $(0, -1)$

* need the slope

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 5}{0 - 2} = \frac{-6}{-2} = 3$$

$$y = 3x - 1$$

④ A line that passes through points $(-3, 2)$ and $(1, 10)$

$$\text{Slope} \Rightarrow \frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 2}{1 - (-3)} = \frac{8}{4} = 2$$

$$y = 2x + b$$

* We need our y-intercept but its not given.

So we have to solve for it by placing either point in for 'x' and 'y'.

use point $(1, 10)$

$$y = 2x + b$$

$$10 = 2(1) + b$$

$$10 = 2 + b$$

$$10 - 2 = b$$

$$8 = b$$

$$y = 2x + 8$$