

Passing through $(7, -2)$ & $(5, 1)$ ✓

"Done using ALL 3 strategies"

① Slope-y-Intercept: $y = mx + b$ Coordinates of ANY point on the line

↑ slope ↑ y-Intercept

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-2 - 1}{7 - 5} = -\frac{3}{2}$$

Equation:
 $y = mx + b$

$$y = -\frac{3}{2}x + \frac{17}{2}$$

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

$$1 = -\frac{3}{2}(5) + b$$

$$1 = -\frac{15}{2} + b + \frac{15}{2} \quad \text{OR} \quad 1 = -\frac{3}{2}(5) + b(2)$$

$$\frac{1}{1} + \frac{15}{2} = 6$$

$$\frac{2}{2} + \frac{15}{2} = 6$$

$$\frac{17}{2} = 6$$

$$2 = -15 + 2b$$

$$\frac{17}{2} = \frac{2b}{2}$$

$$b = \frac{17}{2}$$

Method 2

② Point-Slope Form: $y - y_1 = m(x - x_1)$

$(7, -2)$ & $(5, 1)$

$$m = \frac{-2 - 1}{7 - 5} = -\frac{3}{2}$$

$$y - (-2) = -\frac{3}{2}(x - 7)$$

↑ slope ↑ Point on the line

$$2y + 4 = -3x + 21$$

$$\frac{2y}{2} = \frac{-3x + 21}{2}$$

$$y = -\frac{3}{2}x + \frac{17}{2}$$

Method 3:
Slope Formula

$(7, -2)$ & $(5, 1)$

$$m = \frac{-2 - 1}{7 - 5} = -\frac{3}{2}$$

$$(5, 1) \quad m = \frac{y - y_1}{x - x_1}$$

$$-\frac{3}{2} \cdot \frac{y - 1}{x - 5}$$

$$-3(x - 5) = 2(y - 1)$$

$$-3x + 15 = 2y - 2$$

$$-\frac{3x}{2} + \frac{15}{2} = \frac{2y}{2}$$

$$y = -\frac{3}{2}x + \frac{17}{2}$$

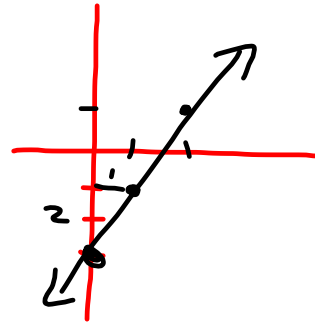
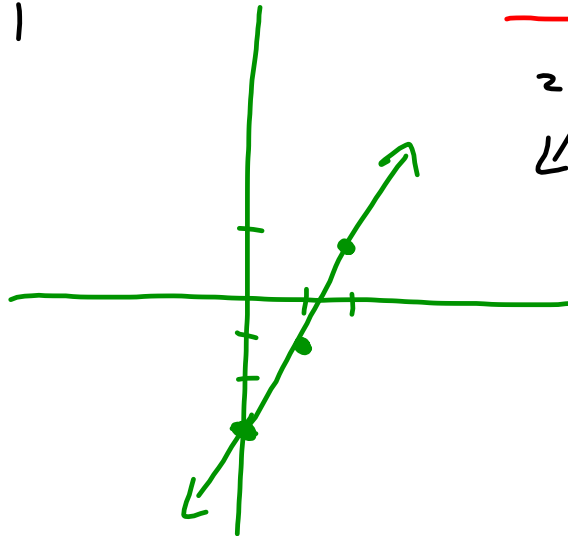
QUIZ tomorrow!!!

① Sketch a line

ex. sketch: $y = 2x - 3$

x	y
0	-3
1	-1
2	1

$m = 2$
 $b = -3$ $m = \frac{2}{1}$



ex. $3x + 4y + 8 = 0$

$$\frac{4y}{4} = \frac{-3x - 8}{4}$$

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

x	y
0	-2
4	-5
-4	1

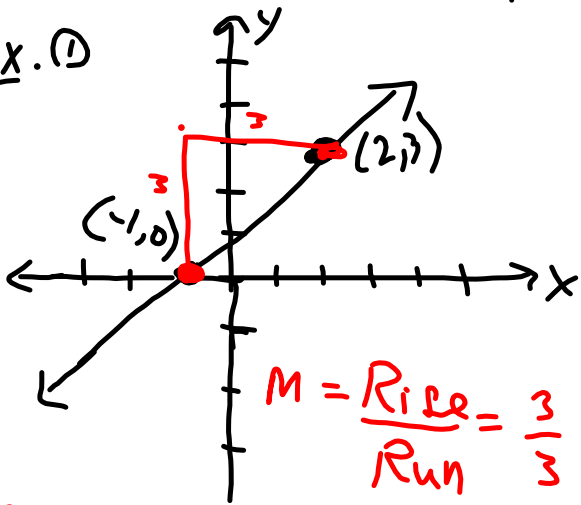
$$y = -\frac{3}{4}(4) - 2$$

$$y = -\frac{3}{4}(\ast) - 2$$

$$= 3 - 2$$

2/ Determine Slope

ex. ①



$$M = \frac{3-0}{2-(-1)} = \frac{3}{3} = 1$$

② Line through $(-2, 5)$ & $(-4, -3)$

$$M = \frac{y_2 - y_1}{x_2 - x_1}$$

$$M = \frac{5 - (-3)}{-2 - (-4)} = \frac{8}{2}$$

$$M = \frac{-3 - 5}{-4 - (-2)} = \frac{-8}{-2} = 4$$

3/ Calculate the x & y Intercepts:

ex. $15x - 3y + 30 = 0$ or $y = mx + b$

x-Int. (y=0)

$$15x - 0 + 30 = 0$$

$$\frac{15x}{15} = \frac{-30}{15}$$

$$x = -2$$

$$\underline{\underline{(-2, 0)}}$$

y-Int. (x=0)

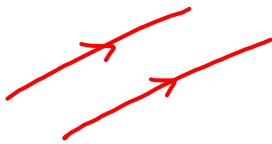
$$-3y + 30 = 0$$

$$\frac{-3y}{-3} = \frac{-30}{-3}$$

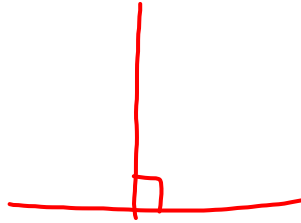
$$\underline{\underline{y = 10}}$$

$$\underline{\underline{(0, 10)}}$$

4/ Parallel Lines / Perpendicular Lines



⇒ Have EQUAL slopes



⇒ NEGATIVE RECIPROCAL slopes

5/ Slope y-Intercept Form: $y = mx + b$

ex. 1) $y = 8x - 7$

$m = 8$

$y\text{-Int.} = -7$

2) $3x - 5y + 8 = 0$

① Rearrange to $y = mx + b$

$$\frac{3x + 8}{5} = \frac{5y}{5}$$

$$y = \frac{3}{5}x + \frac{8}{5}$$

$m = \frac{3}{5}$ $b = \frac{8}{5}$

ex. 2

Determine equation of line with slope $\frac{2}{3}$ and $y\text{-Int.}$ of -4 .

$$y = mx + b$$

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

ex. 3 What is the slope of a line perpendicular to $y = \frac{3}{4}x + 7$?

$m = \frac{3}{4}$

$m = -\frac{4}{3}$