W-A1 Algebra 1 4/27

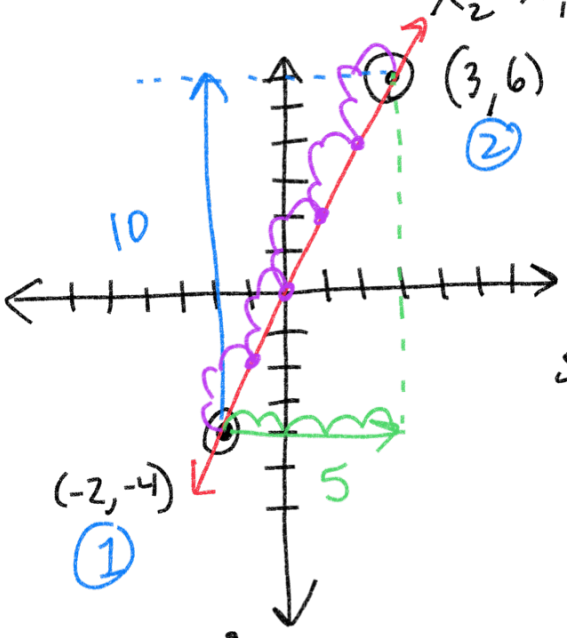
delta = "change"

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{\Delta y}{\Delta x} = \frac{\text{up/down}}{\text{right}}$$

$$\left\{ \text{slope} = \frac{y_2 - y_1}{x_2 - x_1} \right\}$$

(x_1, y_1) (x_2, y_2)

$(-2, -4)$ $(3, 6)$



$$\frac{\text{up } 10}{\text{right } 5} = \frac{10 \div 5}{5 \div 5} = \frac{2}{1} = \boxed{2}$$

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - (-4)}{3 - (-2)} = \frac{6+4}{3+2} = \frac{10}{5}$$

$$\frac{10 \div 5}{5 \div 5} = \frac{2}{1} = \boxed{2}$$

up → positive

down → negative

(x_1, y_1) (x_2, y_2)

$(3, 6)$ $(-2, -4)$

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-4 - 6}{-2 - 3} = \frac{-10 \div -5}{-5 \div -5} = \frac{2}{1} = \boxed{2}$$

x_1 y_1 x_2 y_2

$(-1, -3)$ and $(5, 7)$ Find the slope

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}} = \frac{7 - (-3)}{5 - (-1)} = \frac{7+3}{5+1} = \frac{10 \div 2}{6 \div 2} = \boxed{\frac{5}{3}}$$

"m"

1.) $(-4, 8)$ and $(6, 2)$

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - 2}{-4 - 6} = \frac{6 \div 2}{-10 \div 2} = \frac{3}{-5} = \boxed{\frac{-3}{5}}$$

down 3
5 right

$$\frac{2 - 8}{6 - (-4)} = \frac{-6 \div 2}{10 \div 2} = \boxed{\frac{-3}{5}}$$

2.) (x, y) $(6, 9)$ and (x_1, y_1) $(-2, -7)$

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{9 - (-7)}{6 - (-2)} = \frac{9 + 7}{6 + 2} = \frac{16}{8} = \frac{2}{1} = \boxed{2}$$

slope-intercept form

$$y = mx + b$$

b ← y-intercept

m ← slope

"m"
slope $= \frac{2}{3}$

y-int $= 4$
"b"

$y = mx + b$

$$\boxed{y = \frac{2}{3}x + 4}$$

$y = mx + b$

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

$b = -11$
y-int

$$\boxed{y = \frac{-4}{3}x - 11}$$

$(-4, 2)$ and $(0, 8)$

$y = mx + b$
slope-intercept form

2 pts → linear equation

1.) Find the slope

$$\text{slope} = \text{"m"} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8-2}{0-(-4)} = \frac{6 \div 2}{4 \div 2} = \frac{3}{2} = m$$

2 a) Find/Solve for "b"

pick a point

$(-4, 2)$

x y

$y = mx + b$

$y = \frac{3}{2}x + 8$

$y = mx + b$

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

$m = \frac{3}{2}$

$b = 8$

$2 = \frac{-12}{2} + b$

$2 = -6 + b$

$+6 \quad +6$

$b = 8$

2b) Use point-slope form

$$(x_2 - x_1)m = \left(\frac{y_2 - y_1}{x_2 - x_1}\right)(x_2 - x_1)$$

$$y_2 - y_1 = m(x_2 - x_1)$$

$$y - y_1 = m(x - x_1)$$

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

$$y - 2 = \frac{3}{2}x + \frac{12}{2} =$$

point-slope form

pick a point

$(-4, 2)$

$y - 2 = \frac{3}{2}x + 6$

$+2 \quad +2$

$y = \frac{3}{2}x + 8$