WARM-UP...

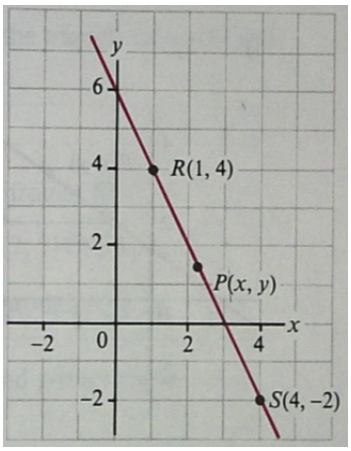
1. Determine the slope, the x intercept and the y intercept of the following line...

$$6x - 3y + 9 = 0$$

2. Determine the equation for each of the following lines...
   Put the equation in the **slope - y intercept form**.

a) passes through the points (-4, 6) & (0, -8).

b)



1. Determine the slope, the x intercept and the y intercept of the following line...

$$6x - 3y + 9 = 0$$

$y = mx + b$

$$\frac{-3y}{-3} = \frac{-6x}{-3} - \frac{9}{-3}$$

$$y = 2x + 3$$

slope: 2

y-Intercept: $(0, 3)$

x-Intercept: $\left(-\frac{3}{2}, 0\right)$

x-Intercept $(y = 0)$

$$6x - 3(0) + 9 = 0$$

$$6x = -9$$

$$x = \frac{-9}{6} = -\frac{3}{2}$$

2. Determine the equation for each of the following lines...
   Put the equation in the **slope - y intercept form**.

a) passes through the points (-4, 6) & (0, -8).

$y = mx + b$

$y = \frac{-7}{2}x + (-8)$

$y = \frac{-7}{2}x - 8$

$y - Int = -8$

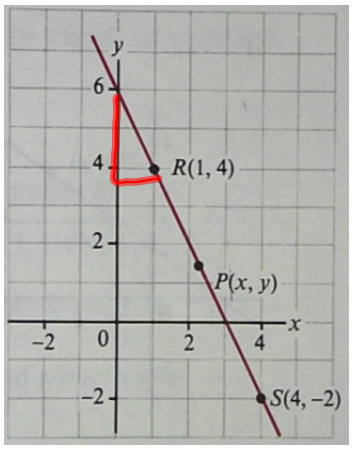
$b = -8$

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

$m = \frac{-8 - 6}{0 - (-4)}$

$m = \frac{-14}{4} = \frac{-7}{2}$

b)



$b = 6$

$m = -2$

$y = -2x + 6$

3/ Find equation of line through

$(-3, 5)$ & $(-2, -7)$

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

$$m = \frac{12}{-1}$$

$$m = -12$$

$y = mx + b$

↑ "calculate" slope

$y = -12x + b$

↑ ↑

coordinates of ordered pairs ON the line

Solve for "b" by substituting a point for (x, y)

$$5 = -12(-3) + b$$

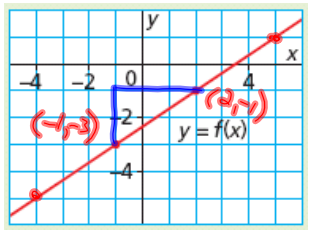
$$5 = 36 + b$$

$$5 - 36 = b$$

$$-31 = b$$

$$\boxed{y = -12x - 31}$$

- Determine the equation of this line



Point on line & Slope of Line

(2, -1)

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

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

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

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

Point-Slope Form

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

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

(x_1, y_1) ← Any point on the line

m ← slope of the line

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

$y + 1 = \frac{2}{3}x - \frac{4}{3}$

$y = \frac{2}{3}x - \frac{4}{3} - 1$

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

OR

$y = mx + b$

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

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

$-1 - \frac{4}{3} = b$

$-\frac{7}{3} = b$

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

Slope y Int. Form

③ Using Slope

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

$(2, -1)$ & (x, y)

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

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

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

$2x - 4 = 3y + 3$

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

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

Ex.

Find the equation of the following line ...

a) Through $(-7, 2)$ with slope $-\frac{2}{5}$ $\quad y = -\frac{2}{5}x - \frac{4}{5}$

$y = mx + b$

$2 = -\frac{2}{5}(-7) + b$

$2 = \frac{14}{5} + b$ $\Rightarrow$ $10 = 14 + 5b$

$\frac{2}{1} - \frac{14}{5} = b$

$\frac{10}{5} - \frac{14}{5} = b$

$b = -\frac{4}{5}$

$-\frac{4}{5} = \frac{56}{5}$

$-\frac{4}{5} = b$

$y - 2 = -\frac{2}{5}(x + 7)$

$y - 2 = -\frac{2}{5}x - \frac{14}{5}$

$y = -\frac{2}{5}x - \frac{14}{5} + \frac{10}{5}$

$y = -\frac{2}{5}x - \frac{4}{5}$

$-\frac{2}{5} = \frac{y - 2}{x + 7}$

$5y - 10 = -2x - 14$

$\frac{5y}{5} = -\frac{2x}{5} - \frac{4}{5}$

$y = -\frac{2}{5}x - \frac{4}{5}$

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4, 5, 8, 9