

Worksheet # 2 Finding the Equation of a Line When Given the Slope (m) and One Point (x, y).

Find the equations for the following lines:

a)  $m = \frac{8}{3}$  and passes through  $(-\frac{3}{2}, 6)$

$$y = mx + b$$

$$6 = \left(\frac{8}{3}\right)\left(-\frac{3}{2}\right) + b$$

$$6 = \frac{-24}{6} + b$$

$$6 = -4 + b$$

$$\begin{array}{l} x \quad y \\ 6 + 4 = b \\ 10 = b \end{array}$$

Egn:  $y = \frac{8}{3}x + 10$

b)  $m = \frac{2}{5}$  and passes through  $(-2, -2)$

$$y = mx + b$$

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

$$-2 = \frac{-4}{5} + b$$

$$-2 + \frac{4}{5} = b$$

$$\begin{array}{l} x \quad y \\ -\frac{2}{1} + \frac{4}{5} = b \\ \frac{-2(5)}{1(5)} + \frac{4}{5} = b \\ \frac{-10}{5} + \frac{4}{5} = b \\ \frac{-6}{5} = b \end{array}$$

Egn:  $y = \frac{2}{5}x - \frac{6}{5}$

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

c)  $m = 4$  and passes through  $(\frac{3}{4}, -\frac{2}{5})$

$$y = mx + b$$

$$-\frac{2}{5} = \left(\frac{4}{1}\right)\left(\frac{3}{4}\right) + b$$

$$-\frac{2}{5} = \frac{12}{4} + b$$

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

$$\begin{array}{l} x \quad y \\ -\frac{2}{5} - \frac{3}{1} = b \\ -\frac{2}{5} - \frac{3(5)}{1(5)} = b \\ -\frac{2}{5} - \frac{15}{5} = b \\ \frac{-17}{5} = b \end{array}$$

$b = -\frac{17}{5}$  OR  $-3\frac{2}{5}$

Egn:  $y = 4x - \frac{17}{5}$

OR  $y = 4x - 3\frac{2}{5}$

d)  $m = -\frac{1}{3}$  and passes through  $(\frac{1}{2}, -\frac{1}{2})$

$$y = mx + b$$

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

$$-\frac{1}{2} = \frac{-1}{6} + b$$

$$-\frac{1}{2} + \frac{1}{6} = b$$

$$\begin{array}{l} x \quad y \\ -\frac{1}{2} \left(\frac{3}{3}\right) + \frac{1}{6} = b \\ -\frac{3}{6} + \frac{1}{6} = b \\ \frac{-2}{6} = b \\ -\frac{1}{3} = b \end{array}$$

Egn:  $y = -\frac{1}{3}x - \frac{1}{3}$

e)  $m = \frac{9}{5}$  and passes through  $(-\frac{5}{3}, \frac{2}{3})$

$$y = mx + b$$

$$\frac{2}{3} = \left(\frac{9}{5}\right)\left(-\frac{5}{3}\right) + b$$

$$\frac{2}{3} = \frac{-45}{15} + b$$

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

$$\begin{array}{l} x \quad y \\ \frac{2}{3} + 3 = b \\ \frac{2}{3} + \frac{3(3)}{1(3)} = b \\ \frac{2}{3} + \frac{9}{3} = b \\ \frac{11}{3} = b \end{array}$$

Egn:  $y = \frac{9}{5}x + \frac{11}{3}$

OR  $y = \frac{9}{5}x + 3\frac{2}{3}$