

FINDING THE EQUATION OF LINES – GIVEN TWO POINTS

Determine the equation of the following lines given the following information.

- 1) passing through points (4, 3) and (2, 9)

x_1, y_1 x_2, y_2

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

$$m = \frac{9 - 3}{2 - 4}$$

$$m = \frac{6}{-2}$$

$$m = -3$$

$$y = mx + b$$

$$3 = -3(4) + b$$

$$3 = -12 + b$$

$$3 + 12 = b$$

$$15 = b$$

$$\therefore y = -3x + 15$$

- 2) passing through points (4, 2) and (8, 4)

x_1, y_1 x_2, y_2

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

$$m = \frac{4 - 2}{8 - 4}$$

$$= \frac{2}{4}$$

$$= \frac{1}{2}$$

$$y = mx + b$$

$$2 = \frac{1}{2}(4) + b$$

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

$$2 = 2 + b$$

$$2 - 2 = b$$

$$0 = b$$

$$\therefore y = \frac{1}{2}x + 0$$

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

- 3) passing through points (4, -1) and (0, 5)

x_1, y_1 x_2, y_2

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

$$m = \frac{5 - (-1)}{0 - 4}$$

$$= \frac{6}{-4}$$

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

$$y = mx + b$$

$$5 = -\frac{3}{2}(0) + b$$

$$5 = 0 + b$$

$$5 = b$$

$$\therefore y = -\frac{3}{2}x + 5$$

- 4) passing through points $(-3, -2)$ and $(6, -8)$

$x_1 \ y_1$ $x_2 \ y_2$

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

$$y = mx + b$$

$$-8 = \frac{-2}{3}(\frac{6}{1}) + b$$

$$-8 = \frac{-12}{3} + b$$

$$-8 = -4 + b$$

$$-8 + 4 = b$$

$$-4 = b$$

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

$$m = \frac{-8 - (-2)}{6 - (-3)}$$

$$m = \frac{-6}{9}$$

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

Use the graphs below to sketch each of the sets of points above to check your answer.

