

1. Given the coordinate points (x_1, y_1) and (x_2, y_2) , find

(a) The gradient

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

$$= \frac{8 - 6}{6 - 3}$$

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

(b) The mid point

$$(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

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

$$= \left(\frac{9}{2}, \frac{14}{2} \right)$$

$$= \left(\frac{9}{2}, 7 \right)$$

(c) The distance between two points

$$\text{Distance} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(6 - 3)^2 + (8 - 6)^2}$$

$$= \sqrt{(3)^2 + (2)^2}$$

$$= \sqrt{9 + 4}$$

$$= \sqrt{13}$$

$$= 3.1 \text{ units}$$

(d) The y-intercept

$$y = mx + c$$

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

(3, 6)

$$b = 2 + c$$

$$6 - 2 = 2 - 2 + c$$

$$4 = c$$

y-intercept is 4

(e) x-intercept

when $y = 0$

$$y = mx + c$$

$$0 = \frac{2}{3}x + 4$$

$$0 - 4 = \frac{2}{3}x + 4 - 4$$

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

$$\frac{-12}{2} = \frac{2x}{2}$$

$$x = -6$$

x-intercept is -6

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

when $y = 0$,

$$0 = \frac{2}{3}x + 4$$

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

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

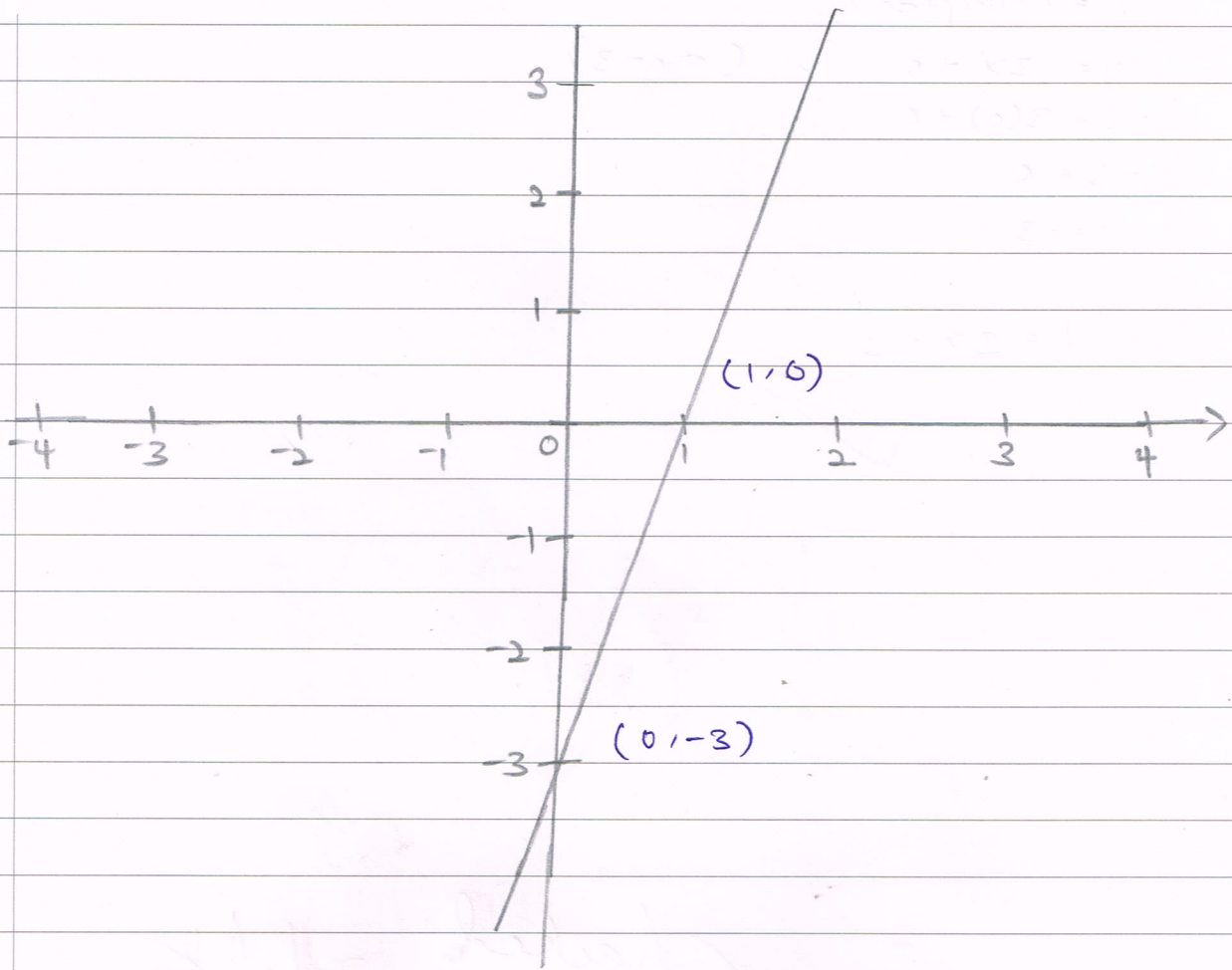
$$x = -6$$

f. The equation is

$$y = mx + c$$

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

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Find

- (a) The mid-point between x -intercept and y -intercept.
 (b) The equation of the straight line.

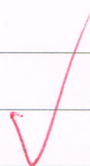
(a) mid point

$$(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$= \left(\frac{1 + 0}{2}, \frac{0 + (-3)}{2} \right)$$

$$= \left(\frac{1 + 0}{2}, \frac{0 - 3}{2} \right)$$

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



(b) $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-3 - 0}{1 - 0} = -3$

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

y = interception

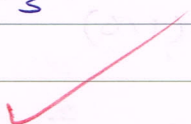
$$y = 3x + c \quad , \quad (0, -3)$$

$$-3 = 3(0) + c$$

$$-3 = c$$

$$c = -3$$

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



Checked 3/1/18