

Point Slope Formula

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

e.g. (i) Find the equation of the line passing through $(-3,4)$ and $(2,-6)$

$$m = \frac{4 + 6}{-3 - 2}$$

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

$$= -2$$

$$y - 4 = -2(x + 3)$$

$$y - 4 = -2x - 6$$

$$\underline{2x + y + 2 = 0}$$

(ii) Find the equation of the line passing through $(2,-3)$ and is parallel to

$$3x + 4y - 5 = 0$$

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

$$\text{required } m = -\frac{3}{4}$$

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

$$4y + 12 = -3x + 6$$

$$\underline{3x + 4y + 6 = 0}$$

$$\text{OR } 3x + 4y + k = 0$$

$$(2, -3) : 3(2) + 4(-3) + k = 0$$

$$-6 + k = 0$$

$$k = 6$$

$$\underline{\therefore 3x + 4y + 6 = 0}$$

(ii) Find the equation of the line passing through (6,4) and is perpendicular to $9x - 4y + 6 = 0$

$$y = \frac{9}{4}x + \frac{6}{4}$$

required $m = -\frac{4}{9}$

$$y - 4 = -\frac{4}{9}(x - 6)$$

$$9y - 36 = -4x + 24$$

$$\underline{4x + 9y - 60 = 0}$$

OR $4x + 9y + k = 0$

$(6, 4): 4(6) + 9(4) + k = 0$

$$60 + k = 0$$

$$k = -60$$

$$\therefore \underline{4x + 9y - 60 = 0}$$

To prove three lines (l, m, n) are concurrent;

- (i) solve l and m simultaneously
- (ii) substitute point of intersection into n
- (iii) if it satisfies the equation, then the lines are concurrent

Exercise 7D; 1e, 2ac, 4c, 6a, 7b, 8abc (i), 9b, 10d, 13, 14, 15, 16, 17, 20