

Aseem Adenigo Frank  
19/11/2019  
MBBS MATHS 1074 Assignment.

①

$$y - 3x - 2 = 0$$

$$y = 3x - 2$$

$$m_1 = 3$$

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

$$3y = -x - 9$$

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

$$y = \frac{-(x + 9)}{3}$$

$$m_2 = -\frac{1}{3}$$

For perpendicular lines  $m_1 m_2 = -1$

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

$\therefore$  The ~~two~~ lines are perpendicular to each other.

2.  $3y - 4 = 2x + 3$

$$3y = 2x + 3 + 4$$

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

$$m_1 = \frac{2}{3}$$

$$y - 5 = x + 6$$

$$y = x + 6 + 5$$

$$y = x + 11$$

$$m_2 = 1$$

For perpendicular lines  $m_1 m_2 = -1$

$$\therefore \frac{2}{3} \times 1 = \frac{2}{3}$$

$\therefore$  The pair of lines are not perpendicular to each other.

$$3) \quad x^2 + y^2 + 8xy - 11 = 0; \quad x=1, y=2.$$

$$\text{Soln}$$

$$2x + 2y \frac{dy}{dx} + 8[x \omega \frac{dy}{dx} + y \omega] = 0$$

$$2x + 2y \frac{dy}{dx} + 8x \frac{dy}{dx} + 8y = 0$$

$$\frac{dy}{dx} [2y + 8x] = -2x - 8y$$

$$\frac{dy}{dx} = \frac{-2x - 8y}{2y + 8x}$$

$$\left. \frac{dy}{dx} \right|_{x=1, y=2} = \frac{-2(1) - 8(2)}{2(2) + 8(1)}$$

$$= \frac{-2 - 16}{4 + 8} = \frac{-18}{12} = -\frac{3}{2} \therefore m = -\frac{3}{2}$$

For tangent:

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

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

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

$$3x + 2y - 4 - 3 = 0$$

$3x + 2y - 7 = 0$  for the eqn of tangent.

For normal:

$$y - y_1 = -\frac{1}{m}(x - x_1)$$

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

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

$$3y - 6 = 2x - 2$$

$$3y - 2x = 6 - 2 = 4$$

$3y - 2x - 4 = 0$  for the eqn of normal.