

$$\frac{dy}{dx} = \frac{-2x + 3y}{2y + 3x}$$

$$M = \frac{-2C_1 - 3C_2}{2C_2 + 3C_1}$$

Chapter Revision Questions  
19 | Maths 1128

19  $y - 3x - 2 = 0$

$y = 3x + 2$

$y = mx + c$

$\therefore m = 3$

$m_1, m_2 = -1$

$m_2 = \frac{-1}{m_1}$

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

For perpendicular

$m_1 m_2 = -1$

$\Rightarrow \cancel{3} - \cancel{3}x - \frac{1}{\cancel{3}} = -1$

$\therefore$  it is perpendicular

(b)  $3y + x + 9 = 0$

$\frac{b_1}{3} = \frac{-x - 9}{3}$

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

$y = mx + c$

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

$$m_1, m_2 = -1$$

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

$$m_2 = 3$$

$$m_1, m_2 = 4$$

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

$\therefore$  It is perpendicular

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

$$8y = 2x + 3 + 4$$

$$8y = 2x + 7$$

$$\frac{8}{8} = \frac{2x + 7}{3} \quad \frac{1}{3}$$

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

$$y = mx + c$$

$$m = 2/3$$

$\therefore$  It is not perpendicular

$$m_1, m_2 = +1$$

$$m_2 = \frac{-1}{2/3}$$

$$m_2 = -3/2$$

$$m_2 = -3/2$$

$$m_1, m_2 = -1$$

$$\Rightarrow \frac{-2/3}{-1/3} \times \frac{-3}{2} = 1$$

$\therefore$  It is not perpendicular  
 ~~$\therefore$  It is perpendicular~~

b)

$$y - 5 = x + 6 \quad (1)$$

$$y = x + 6 + 5$$

$$y = x + 11$$

$$y = mx + c$$

$$m = 1$$

$$m_1 m_2 = -1$$

$$m_2 = \frac{-1}{m_1}$$

$$m_2 = -1$$

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

$$m_1 m_2 = -1$$

$$\Rightarrow -1 \times 1 = -1$$

~~$\therefore$  is perpendicular~~  $\therefore$  is not perpendicular

3

$$x^2 + y^2 + 3xy = 11 \quad (1, 2)$$

$$2x + 2y \frac{dy}{dx} + 3 \left[ \frac{dy}{dx} + y \cdot 1 \right] = 0$$

$$2x + 2y \frac{dy}{dx} + 3x \frac{dy}{dx} + 3y = 0$$

$$\frac{dy}{dx} (2y + 3x) + 2x + 3y = 0$$

$$y-2 = -\frac{7}{8}(x-1)$$

$$8y - 16 = -7x + 7$$

$$8y = -7x + 1 + 16$$

$$8y = -7x + 17$$