ABBAMJO BOLUWATIFE ESTHER MATHS 104 19/MAY/2019

1 $y - 3x - 2 = 0$

$y = 3x - 2$

$m_1 = 3$

$3y + x + 9 = 0$

$3y = -x - 9$

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

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

$m_2 = -1/3$

For Perpendicular lines $m_1 m_2 = -1$

$\therefore 3 \times -1/3 = -1$

The lines are perpendicular to each other

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

$3y = 2x + 3 + 4$

$3y = 2x + 7$

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

$m_1 = 2/3$

$y - 5 = x + 6$

$y = x + 6 + 5$

$y = x + 11$

$m_2 = 1$

For Perpendicular lines $M_1 m_2 = -1$

$\therefore 2/3 \times 1 = 2/3$

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

3 $x^2 + y^2 + 3xy - 11 = 0$, $x = 1$ & $y = 2$

$\frac{d}{dx}\{2x + 2y\,dy/dx + 3[x(1)\,dy/dx + y(1)]\} = 0$

$2x + 2y\,dy/dx + 3x\,dy/dx + 3y = 0$

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

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

$\left.\frac{dy}{dx}\right|_{x=1,\,y=2} = \frac{-2(1) - 3(2)}{2(2) + 3(1)}$

$= \frac{-2-6}{4+3} = \frac{-8}{7}$ $\quad m = -8/7$

for tangent

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

$y - 2 = -8/7(x - 1)$

$7y - 14 = -8(x - 1)$

$7y - 14 = -8x + 8$

$7y - 8x - 14 + 8 = 0$

$7y + 8x - 8 = 0$ (for equation of tangent)

for normal

$y - y_1 = -1/m(x - x_1)$

$y - 2 = 7/8(x - 1)$

$8y - 16 = 7(x - 1)$

$8y - 16 = 7x - 7$

$8y - 7x - 16 + 7 = 0$

$8y - 7x - 9 = 0$ (for equation of normal)