AJIBE TENIOLA PRECIOUS

MBBS

MH6

19/MHS01/069

ASSIGNMENT

Examine whether or not these pair of ones are perpendicular to each other.

1) ~~$y-3x-2=0$~~ $y-3x-2=0$ and $3y+x+9$

2) $3y-4=2x+3$ and $y-5=x+6$

1.) $y-3x-2=0$

$3y+x+9=0$

Lines to be perpendicular then ~~$m_1 m_2 = 1$~~ $m_1 m_2 = 1$

$Y-3x-2=0$

Making y the subject of the formula

$y=3x+2$

By comparing with $y=mx+c$

$m_1=3$

$3y+x+9=0$ Making y the subject of Formula

$3y=-x-9$

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

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

$y=mx+c$ $m_2=-1/3$

1.) $y - 3x - 2 = 0$

$3y + x + 9 = 0$

Lines to be perpendicular then ~~$m_1 m_2 = 1$~~ $m_1 m_2 = 1$

$Y - 3x - 2 = 0$

Making y the subject of the formula

$y = 3x + 2$

By Comparing with $y = mx + c$

$m_1 = 3$

$3y + x + 9 = 0$ Making y the subject of Formula

$3y = -x - 9$

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

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

$= mx + c \quad m_2 = -1/3$

$m_1 m_2 = 1$: for perpendicularity

$3 \times 1/3 = -1$ Since $m_1 m_2 = -1$ take the Lines $y - 3x - 2 = 0$ and $3y + x + 9 = 0$ ARE

$y - 5 = x + 6$

$y = x + 6 + 5$

$y = x + 11$

comparing with $y = mx + c$

$m_2 = 1$

For the lines to be perpendicular

$m_1 m_2 = -1$

$m_1 m_2 = 2/3 \times 1 = 2/3$

$m_2 \neq -1$

n a the lines $3y - 4 = 2x + 3$ and $y - 5 = x + 6$ are NOT PERPENDICULAR

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

$y - 5 = x + 6$

Making y the subject of formula in 1

$3y = 2x + 3 + 4$

$3y = 2x + 7$

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

By comparing with $y = mx + c$

$m_1 = 2/3$

Making y the subject of formula in 2.

$y - 5 = x + 6$

$y = x + 6 + 5$

$y = x + 11$

By comparing with $y = mx + c$

$m_2 = 1$

ut for the lines to be perpendicular

$m_1 m_2 = -1$

$m_1 m_2 = 2/3 \times 1 = 2/3$

$m_1 m_2 \neq -1$

en a the lines $3y - 4 = 2x + 3$ and $y - 5 = x + 6$ are NOT PE

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

$m = \frac{dy}{dx}$

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

$\frac{dy}{dx}$

$2x + 2y\, dy/dx + 3(x \cdot dy/dx + y \cdot 1) = 0$

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

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

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

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

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

$= dy/dx \,|\, x=1, y=2 \quad = \frac{-2(1)-3(2)}{2(2)+3(1)} = \frac{-2-6}{4+3} = -8/7$

Equation of tangent

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

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

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

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

$m = dy/dx \,|\, x=1, y=2 = \frac{-2(1) - 8(2)}{2(2) + 8(1)} = \frac{-2-6}{4+8} = -8/4$

) Equation of tangent

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

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

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

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

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

$7y + 8x - 22 = 0$ is the equation of tangent

Equation of normal

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

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

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

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

$8y - 16 = 7x - 7$

$8y - 7x - 16 + 7 = 0$, $8y - 7x - 9 = 0$ is the equation of normal.