

$$3y = 2x + 80$$

Assignment

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① $y - 3x - 2 = 0$

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

$$m_1, m_2 = -1$$

$$y = 3x + 2$$

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

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

$$m_1, m_2 = -1$$

$$3x - \frac{1}{3} \times 3 = 0$$

∴

The two lines are perpendicular to each other.

② $y - 3x - 2 = 0$

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

$$y = 3x + 2$$

$$m_1 = 3$$

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

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

$$m_1, m_2 = 3 \times -\frac{1}{3} = -1$$

Therefore the two lines are perpendicular.

$$y =$$

$$m_1$$

$$y =$$

$$y =$$

$$y =$$

$$m_1$$

$$m_1$$

The

per

3

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

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

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

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

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

$$y - 5 = x + 6$$

$$y = x + 6 + 5$$

$$y = x + 11$$

$$m_2 = 1$$

$$m_1 m_2 = \frac{2}{3} \times 1 = \frac{2}{3}$$

The two lines are not perpendicular

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

$$x = 1 \quad y = 2$$

Tangent

$$y - y_1 = m_1(x - x_1)$$

At (1, 2)

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

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

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

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

$$\frac{dy}{dx} = \frac{-2(1) - 3(2)}{2(2) + 3(1)}$$

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

$$= \frac{-8}{7}$$

$$y - y_1 = m_1(x - x_1)$$

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

$$y - 2 = \frac{-8x + 8}{7}$$

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

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

$$7y + 8x = 22$$

$$7y + 8x - 22 = 0$$

$$\begin{aligned}y - y_1 &= -\frac{1}{m_1} (x - x_1) \\y - 2 &= -\frac{1}{-8/7} (x - 1) \\y - 2 &= -\frac{7}{-8} (x - 1) \\y - 2 &= \frac{7}{8} (x - 1) \\y - 2 &= \frac{7x - 7}{8}\end{aligned}$$

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

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

$$8y - 7x - 9 = 0$$

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MBBS