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$$4x^2 + 2xy^3 - 5y^2 = 0$$

take derivative with respect to x

$$\frac{d}{dx} (4x^2) + \frac{d}{dx} (2xy^3) - \frac{d}{dx} (5y^2) = \frac{d}{dx} (0)$$

using differential nelle

$$\frac{d}{dx} (ax^2) = ax \frac{d}{dx} (x)$$

$$4x \frac{d}{dx} (x^2) + \frac{d}{dx} (2xy^3) - \frac{d}{dx} (5y^2) = \frac{d}{dx} (0)$$

$$4x \frac{d}{dx} (x^2) + \frac{d}{dx} (2x) \cdot xy^3 + 2x \times \frac{d}{dy} (y^3)$$

$$- \frac{d}{dx} (5y^2) = \frac{d}{dx} (0)$$

$$\frac{d}{dx} (5y^2) = \frac{d}{dy} (5y^2) \times \frac{dy}{dx}$$

$$4x \frac{d}{dx} (x^2) = \frac{d}{dx} (2x) \times y^3 + 2x \times \frac{d}{dx} (y^3)$$

$$- \frac{d}{dy} (5y^2) \times \frac{dy}{dx} = \frac{d}{dx} (0)$$

$$4x \cdot 2x + \frac{d}{dx} (2x) \times y^3 + 2x \times \frac{d}{dx} (y^3) - \frac{d}{dy} (5y^2)$$

$$\times \frac{dy}{dx} = 0$$

$$\frac{dx}{dx}$$



$$\frac{d}{dx} (5y^2) = \frac{d}{dy} (5y^2) \times \frac{dy}{dx}$$

$$4 = \frac{d}{dx} (x^2) = \frac{d}{dx} (2x) \times y^3 + 2x \times \frac{d}{dx} (y^3)$$

$$- \frac{d}{dy} (5y^2) \times \frac{dy}{dx} = \frac{d}{dx} (0)$$

where constant = 0

$$4 \times \frac{d}{dx} (x^2) + \frac{d}{dx} (2x) \times y^3 + 2x \times \frac{d}{dx} (y^3)$$

$$- \frac{d}{dy} (5y^2) \times \frac{dy}{dx} = 0$$

$$\text{using } \frac{d}{dx} (x^n) = n \times x^{n-1}$$

$$\therefore 4 \times 2x + \frac{d}{dx} (2x) \times y^3 + 2x \times \frac{d}{dx} (y^3) - \frac{d}{dy} (5y^2)$$

$$\times \frac{dy}{dx} = 0$$

$$4 \times 2x + 2y^3 \times 2x \times 3y^2 \times \frac{d}{dx} (y) - \frac{d}{dy} (5y^2) \times \frac{dy}{dx} = 0$$

$$\text{using } \frac{d}{dy} (ax^f) = a \times \frac{d}{dy} (x^f)$$

$$4 \times 2x + 2y^3 + 2x \times 3y^2 \times \frac{d}{dx} (y) - 5 \times \frac{d}{dy} (y^2) \times \frac{dy}{dx} = 0$$

$$8x + 2y^3 + 2x \times 3y^2 \times \frac{d}{dx} (y) - 5 \times \frac{d}{dy} (y^2) \times \frac{dy}{dx} = 0$$

$$8x + 2y^3 + 6xy^2 \times \frac{d}{dx} (y) - 5 \times \frac{d}{dy} (y^2) \times \frac{dy}{dx} = 0$$

$$\text{using } \frac{d}{dx} (x^n) = n \times x^{n-1}$$



$$\therefore 8x + 2y^3 + 6xy^2 \times \frac{d}{dy}(y) - 5 \times 2y \times \frac{dy}{dx} = 0$$

using chain rule

$$\frac{d}{dx}(y) = \frac{d}{dy}(y) \times \frac{dy}{dx}$$

$$8x + 2y^3 + 6xy^2 \times \frac{d}{dy}(y) \times \frac{dy}{dx} - 5 \times 2y \times \frac{dy}{dx} = 0$$

$$8x + 2y^3 + 6xy^2 \times \frac{d}{dy}(y) \times \frac{dy}{dx} - 10y \times \frac{dy}{dx} = 0$$

$$8x + 2y^3 + 6xy^2 \times 1 \times \frac{dy}{dx} - 10y \times \frac{dy}{dx} = 0$$

move variables

$$6xy^2 \times \frac{dy}{dx} - 10y \times \frac{dy}{dx} = -8x - 2y^3$$

Divide through by  $6xy^2 - 10y$

$$\frac{dy}{dx} = \frac{-8x - 2y^3}{6xy^2 - 10y}$$

$$= \frac{dy}{dx} = -\frac{4x + y^3}{3xy^2 - 5y}$$