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MATH102

Computer Assignment Engineering  
19/Eng02/042

$$A = 3i + 4j + 6k$$

$$B = 5i - 11j + 2k$$

$$C = 7i - 7j + k$$

$$1. \quad A \cdot C + B \cdot C$$

$$A \cdot C = (3i + 4j + 6k) \cdot (7i - 7j + k)$$

$$= 21i - 28j - 6k$$

$$B \cdot C = (5i - 11j + 2k) \cdot (7i - 7j + k)$$

$$= 35i + 77j + 2k$$

$$A \cdot C + B \cdot C$$

$$= 21i - 28j - 6k + 35i + 77j + 2k$$

$$= 56i + 49j - 4k$$

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Abimbola shot it

$$2) (A-B) \cdot c$$

$$(A-B) = (8i + 4j - 6k) - (5i - 11j + 2k) \\ = 3i + 4j - 6k - 5i + 11j - 2k \\ = -2i + 15j - 8k$$

$$(A-B) \cdot c$$

$$= (-2i + 15j - 8k) \cdot (7i - 7j + k) \\ = -14i - 105j - 8k$$

$$B) A \cdot (B \times c)$$

$$(B \times c) \begin{array}{c|cc} & i & j & k \\ \hline & 5 & -11 & 2 \\ & 7 & -7 & 1 \end{array}$$

$$i \begin{vmatrix} -11 & 2 \\ -7 & 1 \end{vmatrix} - j \begin{vmatrix} 5 & 2 \\ 7 & 1 \end{vmatrix} + k \begin{vmatrix} 5 & -11 \\ 7 & -7 \end{vmatrix}$$

$$i[-11+14] - j[5-14] + k[-77+35]$$

$$3i + 9j - 42k$$

$$A \cdot (B \times c)$$

$$(3i + 4j - 6k) \cdot (3i + 9j - 42k) \\ 9i + 36j + 252k$$

$$dy/dx = x^2 \sin x \left( \frac{2}{x} + \frac{\cos x}{\sin x} \right)$$

$$(3) \quad y = \sin 7x \cos 2x$$

$$\ln y = \ln \sin 7x + \ln \cos 2x$$

$$\frac{d}{dx} (\ln y) = \frac{d}{dx} (\sin 7x) + \frac{d}{dx} (\cos 2x)$$

$$\frac{1}{y} \cdot \frac{dy}{dx} = \frac{1}{\sin 7x} (7 \cos 7x) - \frac{1}{\cos 2x} (2 \sin 2x)$$

$$\frac{1}{y} \cdot \frac{dy}{dx} = \frac{7 \cos 7x}{\sin 7x} - \frac{2 \sin 2x}{\cos 2x}$$

$$\frac{dy}{dx} = y \left( \frac{7 \cos 7x}{\sin 7x} - \frac{2 \sin 2x}{\cos 2x} \right)$$

$$\frac{dy}{dx} = \sin 7x \cos 2x \left( \frac{7 \cos 7x}{\sin 7x} - \frac{2 \sin 2x}{\cos 2x} \right)$$

$$(4) \quad y = \frac{(2x-3x^2)}{1-x}$$

$$\ln y = \ln(2x-3x^2) - \ln|1-x|$$

$$\frac{d}{dx} (\ln y) = \frac{d}{dx} (2x-3x^2) - \frac{d}{dx} (1-x)$$

$$\frac{1}{y} \cdot \frac{dy}{dx} = \frac{1}{(2x-3x^2)} (2-6x) - \frac{1}{1-x} (-1)$$

$$\frac{1}{y} \cdot \frac{dy}{dx} = \frac{2-6x}{2x-3x^2} + \frac{1}{1-x}$$

$$\frac{dy}{dx} = y \left( \frac{2-6x}{2x-3x^2} + \frac{1}{1-x} \right)$$

$$= \frac{(2x-3x^2)}{1-x} \left( \frac{2-6x}{2x-3x^2} + \frac{1}{1-x} \right)$$