

Ozoamen Sonto

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Bio Medical Engineering

$$1) \quad A = (6x^2 + 8)i + (4x - 10)j + 8x^3k$$

$$B = 3xi + (2x - 5)j + 5k$$

$$\text{Find } \frac{d}{dx}(A \cdot B)$$

$$(A \cdot B) = \bar{A} \cdot \bar{B} = (6x^2 + 8)i + (4x - 10)j + 8x^3k$$

$$\bar{B} = 3xi + (2x - 5)j + 5k$$

$$(A \cdot B) = 3xi(6x^2 + 8)i + (2x - 5)j(4x - 10)j + 8x^3k(5k)$$

$$= (18x^3 + 24x)i + (8x^2 - 40x + 50)j + 40x^3k$$

$$= 18x^3 + 24x + 8x^2 - 40x + 50 + 40x^3$$

$$= 18x^3 + 40x^3 + 24x - 40x + 8x^2 + 50$$

$$= 58x^3 - 16x + 8x^2 + 50$$

$$\frac{d}{dx}(A \cdot B) = 174x^2 + 16x - 16$$

$$2) \quad \frac{dA}{dx} = (6x^2 + 8)i + (4x - 10)j + 8x^3k$$

$$\frac{dA}{dx} = 12xi + 4j + 24x^2k$$