

ISAAC ZINE GRACE

BIOMEDICAL ENGINEERING 19/ENG08/004

①
If $A = (6x^2 + 8)i + (4x - 10)j + 8x^3k$
 $B = 3xi + (2x - 5)j + 5k$

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

$$\begin{aligned} \overline{A \cdot B} &= \overline{A} = (6x^2 + 8)i + (4x - 10)j + 8x^3k \\ \overline{B} &= 3xi + (2x - 5)j + 5k \end{aligned}$$

$$\begin{aligned} \overline{A \cdot B} &= 3xi(6x^2 + 8)i + (2x - 5)j(4x - 10)j + 8x^3k(5k) \\ &= (18x^3 + 24x)i + (8x^2 - 40x + 50)j + 40x^3k \\ &= 18x^3 + 24x + 8x^2 - 40x + 50 + 40x^3 \\ &= 18x^3 + 40x^3 + 24x - 40x + 8x^2 + 50 \\ &= 58x^3 - 16x + 8x^2 + 50 \end{aligned}$$

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

② $\frac{dA}{dx} = (6x^2 + 8)i + (4x - 10)j + 8x^3k$
 $\frac{dA}{dx} = 12xi + 4j + 24x^2k$