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i) find $\frac{d}{du}(A \cdot B)$

where $A = (6u^2 + 8)i + (4u - 10)j + 8u^3 k$

$B = 3ui + (2u - 5)j + 5k$

$$\frac{d}{du} = (6u^2 + 8)i + (4u - 10)j + 8u^3 k \times 3ui + (2u - 3)j + 5k$$

$$\frac{d}{du} = (6u^2 + 4u + 2u) + (8 - 10 - 3) + (8u^3 + 5k)$$

$$\frac{d}{du} = (6u^2 + 8u^3) + 8 - 10 - 3$$

$$\frac{d}{du} = (14u^5 + 8 - 10 - 3)$$

$$\frac{d}{du} = 9u^5$$

ii $\frac{dA}{du}$

Since $A = (6u^2+8)i + (4u-10)j + 8u^3k$

$$\frac{dA}{du} = (6u^2+8)j + (4u-10)j + 8u^3k$$

$$\frac{dA}{du} = (6u^2+8u^3k) + 4u - 10$$

$$\frac{dA}{du} = (14k^5 + 4u - 10)$$

$$\frac{dA}{du} = 8k^5$$

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