

Solution

$$(i) \quad (A \cdot B) = ((6U^2 + 8)i + (4U - 10)j + 8U^3k) \cdot (3Ui + (2U - 5)j + 5k)$$
$$= (18U^3 + 8)i + (8U^2 + 50)j + (8U^3 + 5)k$$

$$\frac{d}{du}(AB) = i \frac{d}{du}(18U^3 + 8) + j \frac{d}{du}(8U^2 + 50) + k \frac{d}{du}(8U^3 + 5)$$

$$\frac{d}{du}(AB) = 54U^2i + 16Uj + \underline{\underline{24U^2k}}$$

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

$$= 12Ui + 4j + \underline{\underline{24U^2k}}$$