

Stonye Chuama Joshua

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Assignment 1

Electrical/Electronics

ENEE 217

$$\textcircled{1} F = x^2 \hat{i} + (3x + 2) \hat{j} + \sin x \hat{k}$$

$$\frac{dF}{dx} = 2x \hat{i} + 3 \hat{j} + \cos x \hat{k}$$

$$\textcircled{2} \frac{d^2 F}{dx^2} = 2 \hat{i} - \sin x \hat{k}$$

$$\begin{aligned} \textcircled{3} \left( \frac{dF}{dx} \right) &= a + c = 2(1) \hat{i} + 3 \hat{j} + \cos(0) \hat{k} \\ &= 2 \hat{i} + 3 \hat{j} + 0.999 \hat{k} \\ &= \sqrt{2^2 + 3^2 + (0.999)^2} \\ &= \sqrt{13.998} \\ &= 3.74 \end{aligned}$$

$$\begin{aligned} \textcircled{4} \frac{d}{dx} (F \cdot F) &= (x^2 \hat{i} + (3x + 2) \hat{j} + \sin x \hat{k}) \cdot (x^2 \hat{i} + (3x + 2) \hat{j} + \sin x \hat{k}) \\ &= x^2 + 9x^2 + 12x + 4 + \sin^2 x \\ \frac{d(\sin^2 x)}{dx} &= \sin^2 x = \sin x \end{aligned}$$

$$u = \sin x, v = \sin x$$

$$\frac{du}{dx} = \cos x$$

$$\frac{dv}{dx} = \cos x$$