

1. $f(x) = 5x^2(3 - 2x)$

a. Evaluate: $\frac{df}{dx}$

b. Evaluate: $\frac{d^2f}{dx^2}$

c. Evaluate: $\int_0^1 f(x) dx$

2. $g(t) = Ae^{-bt}$; $b > 0$

a. Evaluate: $\frac{dg}{dt}$

b. Evaluate: $\frac{d^2g}{dt^2}$

c. Evaluate: $\int_0^\infty g(t) dt$

3. $\mathbf{F}(\mathbf{x},\mathbf{y}) = 6\mathbf{x}^2\mathbf{y}^4 + 3\mathbf{y} + 92$

a. Evaluate: $\frac{\partial \mathbf{F}}{\partial \mathbf{x}}$,

b. Evaluate: $\frac{\partial \mathbf{F}}{\partial \mathbf{y}}$,

c. Evaluate: $\frac{\partial^2 \mathbf{F}}{\partial \mathbf{x} \partial \mathbf{y}}$.

4. What are the real and imaginary parts of e^{iN} ?

5. $\vec{A} = 2\hat{i} - \hat{j} + \hat{k}$ and $\vec{B} = \hat{i} + 3\hat{j} - 2\hat{k}$.

a. Evaluate: $\vec{A} + \vec{B}$

b. Evaluate: $\vec{A} - \vec{B}$

c. Evaluate: $\vec{A} \cdot \vec{B}$

d. Evaluate: $\vec{A} \times \vec{B}$

e. Evaluate: $|\vec{A}|$ and $|\vec{B}|$

f. Find the cosine of the angle between \vec{A} and \vec{B} .