

VICTORIA UNIVERSITY BANGLADESH



Assignment On

Course Name : Differential Calculus & Coordinate Geometry

Course code : MAT-115

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Answer to the question NO: 1

$$\begin{aligned} \textcircled{1} \lim_{x \rightarrow 0} \frac{\sqrt{1+x}-1}{x} \\ = \lim_{x \rightarrow 0} \frac{1}{2\sqrt{1+x}} - 0 \quad [L' \text{ hospital rule}] \end{aligned}$$

$$= \lim_{x \rightarrow 0} \frac{1}{2\sqrt{1+x}}$$

$$= \frac{1}{2\sqrt{1+0}} \text{ Ans:}$$

Answer to the question NO: 2

$$\textcircled{2} f(x) = x^3 + 5x^2$$

$$\therefore \frac{d}{dx} [f(x)] = \frac{d}{dx} (x^3 + 5x^2)$$

$$= 3x^2 + 5 \cdot 2x$$

$$= 3x^2 + 10x \text{ Ans:}$$

Answer to the question No-3

$$\textcircled{3} \int (2e^x + \frac{6}{x} + \ln 2) dx$$

$$= 2e^x + 6 \ln x + x \ln 2 + c \text{ Ans.}$$

Answer to the question No. 4

$$\textcircled{1} f(x) = x^2 \sin x$$

$$\therefore f'(x) = \frac{d}{dx} [x^2 \sin x]$$

$$= x^2 \frac{d}{dx} (\sin x) + \sin x \frac{d}{dx} (x^2)$$

$$= x^2 \cos x + \sin x \cdot 2x$$

$$= x (x \cos x + 2 \sin x) \text{ Ans.}$$