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Mid Assessment

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Course Code: MAT-225

Course Title: Differential Equations and
Fourier ~~Analysis~~ Analysis.

Ans to the ques NO-2

$$\Rightarrow \lim_{x \rightarrow 0} \frac{\sqrt{1+x}-1}{x}$$

By using rationalization

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

$$= \lim_{x \rightarrow 0} \frac{(1+x)-1}{x(\sqrt{1+x}+1)}$$

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

$$= \frac{1}{\sqrt{1+1}} = \frac{1}{2}$$

Answer to the question No-2

2. Given, $f(x) = x^3 + 5x^2$
Differentiating with respect to x , we get

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

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

$$\Rightarrow f'(x) = 3x^2 + 10x$$

Ans to the ques No-3

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

$$= 2 \int e^x dx + 6 \int \frac{1}{x} dx + \ln 2 \int dx$$

$$= 2e^x + 6 \ln x + \ln 2 \cdot x + C$$

Ans to the ques No-4

$$\text{Given, } f(x) = x^2 \sin x$$

$$\Rightarrow f'(x) = 2x \sin x + x^2 \cos x$$