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SEC _____

Quiz 3

[Important: Write all necessary steps for solution of each question]

1. Find the values of a and b for which

$$f(x) = \begin{cases} 3x^2, & x \leq 1, \\ ax + b, & x > 1. \end{cases}$$

Differentiable.

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2. Find the points on the parabola $y = x - x^2$ where the tangent lines pass through the point $(0,1)$.

3. Evaluate $\lim_{x \rightarrow 3} \frac{x^3 - 27}{\sin(x - 3)}$

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[Important: Write all necessary steps for solution of each question]

3. Let $f(x) = \frac{e^x \cos x}{g(x)}$ where $g(0) = 2$, $g'(0) = 5$.

Find $f'(0)$.

2. Evaluate $\lim_{t \rightarrow (\pi/2)^-} \left(t - \frac{\pi}{2} \right) \tan t$

[Important: Write all necessary steps for solution of each question]

1. Find $\frac{d^{51}}{dx^{51}}(\cos(2\pi x))$ when $x = 1/2$.

3. Find the points on the parabola $y = x^2 - x$ where the tangent lines pass through the point $(0, -1)$.

2. Evaluate $\lim_{x \rightarrow 1^-} \frac{(x-1)\csc(2x-2)}{x^2 + 5x + 9}$

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[Important: Write all necessary steps for solution of each question]

1 Find an equation of normal line to the curve

$$y = xe^x \sec x \text{ at the point } (0,0).$$

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3. Let $f(x) = \frac{e^x \cos x}{g(x)}$ where $g(0) = 2$, $g'(0) = 5$.

Find $f'(0)$.

2. Evaluate $\lim_{t \rightarrow (\pi/2)^-} \left(t - \frac{\pi}{2} \right) \tan t$