json -> latex convert test

kora

Questions

1. Let $f(x) = e^{2x}$. Find the derivative of f at $x = 1$, denoted as $f'(1)$. [5]

2. For the function $g(x) = x^3 - 6x^2 + 9x + 5$, find the value of x at which g'(x) = 0. [5]

3. Evaluate the definite integral: $I = \frac{d}{dx}\Big|_{x=0}^{x=\frac{\pi}{2}} x\sin(x)$. [5]

4. Find the area under the curve of $y = x^2 + 3x - 4$ between x = 1 and x = 3. [5]

5. Given $f(x) = e^x$ and $g(x) = x^2$, find the derivative of their product at x=1. [5]

6. Calculate the integral of $\frac{\sin(2x)}{4+\cos^2(x)}$. Let this result be denoted as K. [5]

7. If z = 3 + 4i, calculate |z| and find the conjugate of z. [5]

8. Solve for x if $(x + 2) + i(3 - x^2)$ is purely imaginary. [5]

9. Evaluate the complex integral of $\frac{\exp(iz)}{z^2+4}$, along a path that encloses only the positive imaginary a [5]

10. Given $f(x) = x^4+ax^3+bx^2+cx+d$ where a, b, c, d are constants. If the function has two distinc [5]
x=1 and x=-1, what is f"(0)?