

N. 4

1. (3 points) Calculate the limit $\lim_{x \rightarrow 0} \frac{\ln \sqrt{1-x^2} + 1 - \cos x}{x^4}$.
2. (3 points) Find the integral $\int \frac{1}{\cos^4 x} dx$.
3. (3 points) Calculate the definite integral $\int_0^{\ln 2} \sqrt{e^x - 1} dx$.
4. (3 points) Find the length of the curve $y = \ln \cos x, x \in [-\frac{\pi}{3}, \frac{\pi}{3}]$.