

N. 2

1. (3 points) Calculate the limit $\lim_{x \rightarrow 0} \frac{\ln(1-x) + \operatorname{arctg} x}{x^2}$.
2. (3 points) Find the integral $\int \frac{\operatorname{arctg} e^x}{e^x} dx$.
3. (3 points) Calculate the definite integral $\int_0^{\frac{1}{16}} \frac{1}{\sqrt{x} - \sqrt[4]{x}} dx$.
4. (3 points) Find the surface area of the body obtained by revolution of the curve $x^{2/3} + y^{2/3} = 1$ around the Oy axis.