N. 5

1. (3 points) Calculate the limit $\lim\limits_{x \to 0} \left(\ln(1 + x^2) \right)^{\arcsin x}$.

2. (3 points) Find the integral $\int \dfrac{x^3 + 1}{x^4 - 3x^2 - 4} \, dx$.

3. (3 points) Calculate the definite integral $\int_0^1 \dfrac{1}{\sqrt{x} + \sqrt[3]{x}} \, dx$.

4. (3 points) Find the surface area of the body obtained by revolution of the curve $y = e^x$, $x \in [0, 1]$ around the Ox axis.