

N. 6

1. (3 points) Calculate the limit $\lim_{x \rightarrow 0} \frac{\ln \sqrt{1+x^2} + \cos x - 1}{x^4}$.
2. (3 points) Find the integral $\int \frac{\arcsin x}{\sqrt{1+x}} dx$.
3. (3 points) Calculate the definite integral $\int_0^{\frac{\pi}{2}} \sin x \cos 2x dx$.
4. (3 points) Find the volume of the body obtained by revolution around the Oy axis of the domain bounded by the curves $y = \cos x$ and $y = 1 - \frac{2x}{\pi}$ ($0 \leq x \leq \frac{\pi}{2}$).