N. 14

1. (3 points) Calculate the limit $\lim\limits_{x \to 0} \dfrac{\ln \sqrt{1 - x^2} + 1 - \cos x}{x^4}$.

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

3. (3 points) Calculate the definite integral $\displaystyle\int_0^{\ln 2} \sqrt{e^x - 1}\,dx$.

4. (3 points) Find the length of the curve $y = \ln \cos x,\ x \in [-\dfrac{\pi}{3}, \dfrac{\pi}{3}]$.