

Name:

ID:

Q1. Define the function f by

$$f(x) = \int_0^{\sin x} \cos^7 t \, dt.$$

Evaluate $f'(\frac{\pi}{3})$.Q2. Evaluate the following limit, by writing it as the integral of a function defined on $[0, 1]$:

$$\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{i=1}^n \sin \frac{\pi i}{n}$$

Q3. Evaluate the integral

$$\int_0^1 (\sinh x - \sqrt{1-x^2}) dx.$$