Exercise 1 (5 points)

Express the given limit as a definite integral: $\lim_{n \to \infty} \sum_{i=1}^{\infty} e^{x_i} \Delta x$ on $[1, 5]$ (show all your steps)

Exercise 2 (5 points)

Evaluate the integral $\int \frac{\sin 2x}{1 - \sin^2 x} \, dx$ (show all your steps)
Exercise 1 (5 points)

Express the given limit as a definite integral:

\[
\lim_{n \to \infty} \frac{1}{n} \sum_{i=1}^{n} \frac{1}{1 + \left( \frac{i}{n} \right)^2}
\]

(show all your steps)

Exercise 2 (10 points)

Evaluate the integral

\[
\int_{0}^{\pi} \frac{\sin x + \sin x \tan^2 x}{\sec^2 x} \, dx
\]

(show all your steps)
Exercise 1 (5 points)

Express the given limit as a definite integral:

$$\lim_{n \to \infty} \frac{1}{n} \sum_{i=1}^{n} \frac{\ln\left(1 + \frac{i}{n}\right)}{1 + \left(\frac{i}{n}\right)^2}$$

(show all your steps)

Exercise 2 (10 points)

Evaluate the integral

$$\int_0^\pi \frac{\cos x + \cos x \cdot \cot^2 x}{\csc^2 x} \, dx$$

(show all your steps)