

Provide a clear and organized presentation. Show all of your work and completely simplify your answer. Evaluate the following integrals:

1. $\int \frac{e^{2x}}{e^{2x} + e^{-x}} dx$

2. $\int \frac{1}{x^2} \sin \frac{1}{x} \cos^2 \frac{1}{x} dx$