

1. Evaluate $\lim_{x \rightarrow 0} \frac{e^{-2x} - 1}{\sin^{-1} x}$

2. Evaluate $\lim_{x \rightarrow 0^+} (1 + \sin(3x))^{1/x}$

3. Evaluate $\int_0^{\pi/4} x \sec^2 x \, dx$.

4. Evaluate $\int x^2 e^{3x} \, dx$