

1. Find $\int x \sec^2 x \, dx$.

2. Find the value of $\int_1^2 \sqrt{t} \ln t \, dt$.

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

4. Use the method of integration by parts to find the value of $\int_0^{\frac{1}{2}} \arcsin x \, dx$