

Evaluate the following integrals.

1. $\int_1^{e^3} \ln(x) \, dx$

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

3. $\int \cos(x) \sin(x) e^{\sin(x)} \, dx$

(Hint: Be clever with parts or substitute $u = \sin(x)$)

4. $\int x^3 \cos(x^4) \, dx$

5. $\int x^2 \sin(x^2) \, dx$

6. $\int \arctan(x) \, dx$

7. $\int_2^3 \frac{x^2 - 1}{x^3 - 3x} \, dx$

8. $\int e^x \sin(e^x) \, dx$