

3. (8 points) Evaluate the following integral. Simplify your answer where possible.

$$\int_1^{\infty} \frac{1+e^x}{e^x(1-e^x)} dx$$

3. (8 points) Evaluate the integral

$$\int_1^{\infty} \frac{\sin(1/x)}{x^2} dx.$$

If this integral does not converge, explain why.

3. (8 points) Evaluate the integral

$$\int_2^{\infty} x^5 e^{-x^3} dx.$$

3. (8 points) Consider the improper integral

$$\int_1^5 \frac{dx}{x^2 \sqrt{25 - x^2}}.$$

Evaluate this integral or explain why it does not converge.

3. (6 points) Consider the improper integral

$$\int_1^{\infty} \frac{\ln(x)}{x^2} dx.$$

Evaluate this integral or explain why it does not converge.

3. (8 points) Consider the improper integral

$$\int_1^{\infty} \frac{1}{x+x^2} dx.$$

Evaluate this integral or explain why it does not converge.