

---

# Exam I Review Problems

---

1. Evaluate the integral

$$\int \frac{1}{x^2 - 9} dx$$

2. Evaluate the integral

$$\int_0^{\pi/2} \sin \theta e^{\cos \theta} d\theta$$

3. Evaluate the integral

$$\int_2^3 \frac{1}{\sqrt{3-x}} dx$$

4. Evaluate the integral

$$\int \sin^4 t dt$$

5. Evaluate the integral

$$\int_1^{\infty} \frac{1}{(2x-1)^3} dx$$

6. Evaluate the integral

$$\int e^x \cos x dx$$

7. Evaluate the integral

$$\int \frac{x^3}{\sqrt{x^2+4}} dx$$

8. Approximate the integral with  $n = 10$

$$\int_1^4 \sqrt{x} \cos(x) dx$$

(a) Using the Trapezoidal Rule

(b) Using the Midpoint Rule

(c) Using Simpson's Rule

9. Estimate the errors involved in the previous problem. How large should  $n$  be in each case to guarantee an error of less than 0.00001?