

Exam 1 Practice Exercises

1. $\int_0^1 x e^{-x^2} dx$

$$2. \int \frac{(\ln x)^2}{x^3} dx$$

3. $\int \csc^4 \theta \cot^4 \theta \, d\theta$

$$4. \int_1^{2/\sqrt{3}} \frac{\sqrt{x^2-1}}{x^4} dx$$

5. $\int \frac{x^3+4x+3}{(x^2+1)(x^2+4)} dx$

6. Approximate $\int_2^3 \frac{1}{\ln x} dx$ using the Trapezoidal Rule with $n = 4$. Round the final answer to 2 decimal places.

7. $\int_{-\infty}^0 \frac{x}{x^2+4} dx$

8. Find the area of the region enclosed by $y = 1$ and $y = e^{-x}$, where $0 \leq x \leq 1$.

9. Let R be the region enclosed by $y = e^x$ and $y = 1$, where $0 \leq x \leq 1$. Find the volume of the solid obtained by rotating R around the: (a) x -axis; (b) y -axis.

10. A cable that weighs 2 lb/ft is used to lift 800 lb up 500 ft. Find the work done.

11. The temperature (in °F) in a city t hours after 9am is modeled by the function $T(t) = 50 + 14 \sin\left(\frac{\pi}{12}t\right)$. Find the average temperature from 9am to 9pm.