

Practice Midterm Exam #1

Below is a sample of midterm which you can use for preparation.

1. Evaluate the following integrals:

(a) $\int x^{1/3} \ln x \, dx.$

(b) $\int \frac{u+3}{(u-1)(u-3)} du.$

(c) $\int \frac{dx}{(1+\sin x)}.$

(d) $\int (1+\sqrt{x})^{1/2} \, dx.$

2. Determine whether each improper integral is convergent or divergent. Evaluate the integrals which are convergent:

(a) $\int_1^3 \frac{dx}{x-1}.$

(b) $\int_0^\infty \frac{dx}{1+e^x}.$

3. Determine how large do we have to choose n to evaluate $\int_0^1 \sin(x^2) dx$ with an error less than 0.001 using Simpson rule. Write formula for this approximation. Do not evaluate!

4. Determine whether each integral is convergent or divergent. Justify your answer. Do not try to evaluate these integrals!

(a) $\int_0^1 \frac{e^x}{x} dx.$

(b) $\int_0^1 \frac{e^x}{\sqrt{x}} dx.$