

Math 1221: Recitation 5 (R)

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(1) Solve the following.

(a) Determine whether the improper integral $\int_1^2 \frac{\ln((x-1)^2)}{\sqrt{x-1}} dx$ converges or diverges. If the integral converges, determine the value of the integral..

(b) Determine whether the improper integral $\int_{-\infty}^0 e^x \sin x dx$ converges or diverges. If the integral converges, determine the value of the integral..

(c) Determine whether the improper integral $\int_3^5 \frac{1}{(x-4)^2} dx$ converges or diverges. If the integral converges, determine the value of the integral..

(2) Solve the following questions. **(Do any one of them).**

(a) Approximate the integral using $\int_0^4 \sqrt{4+x^3} dx$ Simpson's Rule for $n = 6$.

Formula: $\frac{b-a}{3} (f(x_0) + 4f(x_1) + 2f(x_2) + \cdots + f(x_n))$

(b) Approximate the integral using $\int_0^1 \sqrt{4+x^3} dx$ Trapezoidal Rule for $n = 5$.

Formula: $\frac{b-a}{2} (f(x_0) + 2f(x_1) + 2f(x_2) + \cdots + 2f(x_{n-1}) + f(x_n))$