

Problem Set 15

Test the following integrals for convergence:

1) Test the integral $\int_0^{\infty} \frac{dx}{x^3 + 8}$ for convergence using the direct comparison test.

2) Test the integral $\int_0^{\infty} \frac{dx}{x^3 + 8}$ for convergence using the limit comparison test.

3) Test the integral $\int_1^5 \frac{x-1}{\sqrt{x}(x-2)} dx$ for convergence using the direct comparison test.

4) Test the integral $\int_1^5 \frac{x-1}{\sqrt{x}(x-2)} dx$ for convergence using the limit comparison test.

5) (Hard) Determine the convergence of the integral $\int_1^{\infty} \frac{e^x}{\sqrt{x-1}}$.

6) (Hard) Determine the convergence of the integral $\int_{-2}^2 \frac{\cos x}{|x^2-1|^{1/4}} dx$.