CALCULUS

Bachelor in Computer Science and Engineering

Course 2021–2022

Improper integrals

Problem 11.1. Study the convergence of the following improper integrals.

$$\int_3^{+\infty} \frac{\ln^2(x)}{x}\,dx\,.$$

$$\int_1^{+\infty} \sin\left(\frac{1}{x}\right)\,dx\,.$$

$$\int_1^{+\infty} \frac{\sin(x)}{1+x^3}\,dx\,.$$

$$\int_1^{+\infty} \frac{dx}{x^\alpha\sqrt{1+x^2}}\,,\quad \alpha>0\,.$$

$$\int_1^{+\infty} \left(\frac{1}{\sqrt{x}} - \arctan\left(\frac{1}{\sqrt{x}}\right)\right)\,dx\,.$$

$$\int_0^{+\infty} x^n e^{-x}\,dx\,,\quad n\in\mathbb{N}\,.$$

$$\int_{-\infty}^{+\infty} e^{-x^2}\,dx\,.$$