

Some examples of calculation improper integrals using CAS

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Improper integrals are taught students in framework of such academic courses as: Calculus, Mathematical Analysis or Higher Mathematics as a standard. In this talk we would like to present some didactics examples representing different approaches to calculate improper integrals using Mathematica and wxMaxima. We will present two examples of improper integral calculated using Riemann sums. We will compare Riemann and Lebesgue approaches to integral $\int_0^{\infty} \frac{\sin x}{x} dx$. We will also analyse complex approach to calculate improper integrals

on the following examples: $\int_{-\infty}^{\infty} \frac{x^2}{x^6 + 6x^4 + 9x^2 + 4} dx$ and $\int_L \frac{\operatorname{Re} z}{\bar{z}} dz$ where L is a broken line ABC on Gauss plane and $A = -1, B = 0, C = i$.

Keywords

Higher education, Improper integrals, Application of CAS, Mathematica, Mathematical didactics

References

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