Series 05: Improper Integrals

Exercice 01 : *Determine if each the following integrals converge or diverge, if the integral converges determine its value:*

- 1) $\int_{-\infty}^{0} e^{4x}dx$, 2) $\int_{1}^{2} \frac{1}{x-2}dx$,
- 3) $\int_{0}^{1} \frac{e^{\sqrt{x}}}{\sqrt{x}}dx$, 4) $\int_{-1}^{0} x^2 ln|x|dx$
- 5) $\int_{\frac{\sqrt{3}}{2}}^{1} \frac{1}{\sqrt{1-x^2}}dx$, 6) $\int_{0}^{1} \frac{lnx}{(1+x)^2}dx$.

Exercice 02 : *Study the convergence of the following improper integrals:*

- 1) $\int_{1}^{\infty} \frac{1}{x\sqrt{x+2}}dx$,
- 2) $\int_{1}^{\infty} \frac{sinx}{x\sqrt{x}}dx$,
- 3) $\int_{1}^{\infty} \frac{ln(1+\sqrt[3]{x})}{e^{sinx}-1}dx$,