

- $\int x^2 \ln x \, dx$

- $\int \tan^5 x \sec x \, dx$

- $\int \sin^5 x \cos^9 x \, dx$

- $\int \frac{dx}{\sqrt{x^2 - a^2}}$, where $a > 0$.

- Does $\int_0^5 \frac{e^x}{x} dx$ converge?

- Does $\int_2^\infty \frac{3 + e^{-x}}{x^5} dx$ converge?

- Break the following into partial fractions:

$$\frac{5x + 7}{x^4 - x^2}$$