

$$\int_0^{\infty} \frac{x^2}{5+x^3} dx$$

$$= \lim_{t \rightarrow \infty} \int_0^t \frac{x^2}{5+x^3} dx$$

$$= \lim_{t \rightarrow \infty} \left[\frac{1}{3} \ln|5+x^3| \right]_0^t$$

$$= \frac{1}{3} \lim_{t \rightarrow \infty} (\ln|5+t^3| - \ln 5)$$

$= \infty$, the integral diverges.

$$\int \frac{x^2}{5+x^3} dx$$

$$= \frac{1}{3} \int \frac{3x^2}{5+x^3} dx$$

$$= \frac{1}{3} \ln|5+x^3|$$

(doing u-sub in head)