

Session 75

$$\int \frac{u-11}{(u^2+9)(u+2)} du$$

$$\int \frac{u-11}{(u^2+9)(u+2)} du = \int \left(\frac{-1}{u+2} + \frac{M + \frac{1}{2}}{u^2+9} \right) du = -\ln|u+2| + \frac{1}{2} \ln|u^2+9|$$

$$-\frac{1}{3} \tan^{-1}\left(\frac{u}{3}\right) + C$$

Integral of $\frac{x^3}{x^2-1}$

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$$\int \frac{x^3}{x^2-1} dx = \int \left(\frac{-x}{x^2-1} + x \right) dx = \int \left(\frac{-\frac{1}{2}}{(x-1)} + \frac{-\frac{1}{2}}{(x+1)} + x \right) dx$$
$$= -\frac{1}{2} \ln|x-1| - \frac{1}{2} \ln|x+1| + \frac{x^2}{2} + C$$