

A handwritten mathematical derivation showing the integration of $(1-x^2)^2$ using the binomial theorem and the power rule. The expression $(1-x^2)^2$ is expanded into $1 - 2x^2 + x^4$. Each term is then integrated separately: $\int 1 dx$, $\int -2x^2 dx$, and $\int x^4 dx$. The final result is $x - \frac{2}{3}x^3 + \frac{1}{5}x^5 + C$.

$$\begin{aligned} & \int (1-x^2)^2 dx \\ &= \int (1 - 2x^2 + x^4) dx \\ &= \int 1 dx - 2 \int x^2 dx + \int x^4 dx \\ &= x - \frac{2}{3}x^3 + \frac{1}{5}x^5 + C \end{aligned}$$