Table of familiar series expansions

1. $\frac{1}{1-x} = \sum_{n=0}^{\infty} x^n$ for $-1 < x < 1$.
2. $\ln(1+x) = \sum_{n=1}^{\infty} (-1)^{n+1} \frac{x^n}{n}$ for $-1 < x \leq 1$.
3. $\sin(x) = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!}$ for all x.
4. $\cos(x) = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!}$ for all x.
5. $e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!}$ for all x.

Integrals involving $\sqrt{x^2 \pm a^2}$ for $a > 0$.

1. $\int \sqrt{x^2+a^2}\, dx = \frac{x}{2}\sqrt{x^2+a^2} + \frac{a^2}{2} \ln|x + \sqrt{x^2+a^2}| + C$
2. $\int \frac{dx}{\sqrt{x^2+a^2}} = \ln|x + \sqrt{x^2+a^2}| + C$

End of Examination