

# Calculus II

## Table of frequently encountered power series expansions

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Here is a table of some important Maclaurin series we have learned:

Function	Series	$R$
$\frac{1}{1-x}$	$= \sum_{n=0}^{\infty} x^n = 1 + x + x^2 + x^3 + \dots$	1
$\arctan x$	$= \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{2n+1} = x - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} + \dots$	1
$e^x$	$= \sum_{n=0}^{\infty} \frac{x^n}{n!} = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$	$\infty$
$\sin x$	$= \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n+1)!} = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$	$\infty$
$\cos x$	$= \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n}}{(2n)!} = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \dots$	$\infty$