

# CPSC 413 Cheatsheet

## Summations

Summation	Formula
$\sum_{k=1}^m k$	$\frac{m(m+1)}{2}$
$\sum_{k=1}^m k^2$	$\frac{m(m+1)(2m+1)}{6}$
$\sum_{k=1}^m k^3$	$\left(\frac{m(m+1)}{2}\right)^2$
$\sum_{k=0}^n z^k$	$\frac{1-z^{n+1}}{1-z}$
$\sum_{k=0}^{\infty} z^k$	$\frac{1}{1-z}$
$\sum_{k=0}^{\infty} \frac{z^k}{k!}$	$e^z$
$\sum_{k=1}^{\infty} \frac{(-1)^{k+1}}{k}$	$\ln 2$
$\sum_{k=0}^{\infty} \frac{1}{k!}$	$e$
$\sum_{k=1}^{\infty} \frac{1}{k^2}$	$\frac{\pi^2}{6}$
$\sum_{k=1}^{\infty} \frac{1}{k^4}$	$\frac{\pi^4}{90}$
$\sum_{k=0}^{\infty} \binom{\alpha}{k} z^k$	$(1+z)^\alpha, \quad  z  < 1$
$\sum_{k=0}^n \binom{n}{k}$	$2^n$
$\sum_{k=0}^{\infty} \frac{(-1)^k z^{2k+1}}{(2k+1)!}$	$\sin z$
$\sum_{k=0}^{\infty} \frac{(-1)^k z^{2k}}{(2k)!}$	$\cos z$