



# IIUM cat-us-trophy

## Contents

### Sums

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$$\sum_{k=0}^n k = n(n+1)/2$$

$$\sum_{k=0}^n k^2 = n(n+1)(2n+1)/6$$

$$\sum_{k=0}^n k^4 = (6n^5 + 15n^4 + 10n^3 - n)/30$$

$$\sum_{k=0}^n x^k = (x^{n+1} - 1)/(x - 1)$$

$$1 + x + x^2 + \cdots = 1/(1 - x)$$

$$\sum_{k=a}^b k = (a+b)(b-a+1)/2$$

$$\sum_{k=0}^n k^3 = n^2(n+1)^2/4$$

$$\sum_{k=0}^n k^5 = (2n^6 + 6n^5 + 5n^4 - n^2)/12$$

$$\sum_{k=0}^n kx^k = (x - (n+1)x^{n+1} + nx^{n+2})/(x-1)^2$$