

## Sequences and Series

- **The nth term**

$$U_n = S_n - S_{n-1}$$

- **Finding terms of AP's and GP's**

$$\text{AP: } U_n = a + (n-1)d \quad \text{GP: } U_n = ar^{n-1}$$

- **Arithmetic and Geometric Means**

$$\text{- A.M} = \frac{x+y}{2}$$

$$\text{- G.M} = \pm\sqrt{xy}$$

- **Sum to n terms of an AP**

$$S_n = \frac{n}{2}[2a + (n-1)d]$$

- **Sum to n terms of a GP**

$$S_n = \frac{a(1-r^n)}{1-r}, \quad r < 1$$

$$S_n = \frac{a(r^n-1)}{r-1}, \quad r > 1$$

$$S_n = na, \quad r = 1$$

- **Sum to infinity of a GP**

$$S_\infty = \frac{a}{1-r}$$

- **Simple Interest**

$$I = Prn$$

- **Compound Interest**

$$A = P(1+r)^n$$

$$I = A - P$$