

---

Common difference

$$r = u_{n+1} - u_n$$

---

Expression for the nth term

$$u_n = u_1 + (n - 1)r$$

---

Arithmetic sequences

Monotonicity

Increasing if  $r > 0$   
Decreasing if  $r < 0$

---

Sum of the first n terms

$$S_n = \frac{u_1 + u_n}{2} \times n$$

---

Common ratio

$$r = \frac{u_{n+1}}{u_n}$$

---

Expression for the nth term

$$u_n = u_1 \times r^{n-1}$$

---

Geometric sequences

Monotonicity

Increasing if  $u_1 > 0 \wedge r > 1$   
Decreasing if  $u_1 < 0 \wedge r > 1$   
Not Monotonic if  $r < 0$

---

Sum of the first n terms

$$S_n = u_1 \times \frac{1 - r^n}{1 - r}$$

---

Simple Interest

$$FV = P \times (1 + r \times t)$$

$FV$  : Future Value

$P$  : Principal

$t$  : time

Compound Interest

$$FV = P \times (1 + r)^t$$

$r$  : interest rate

---