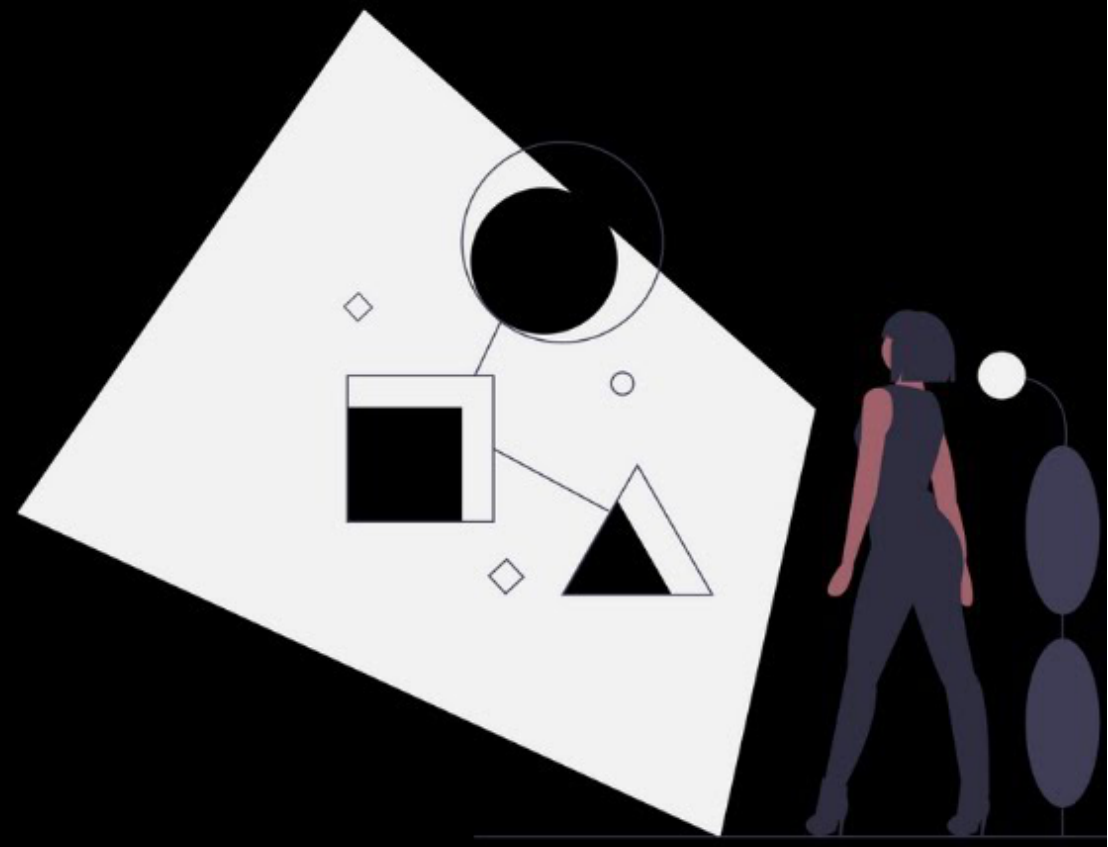
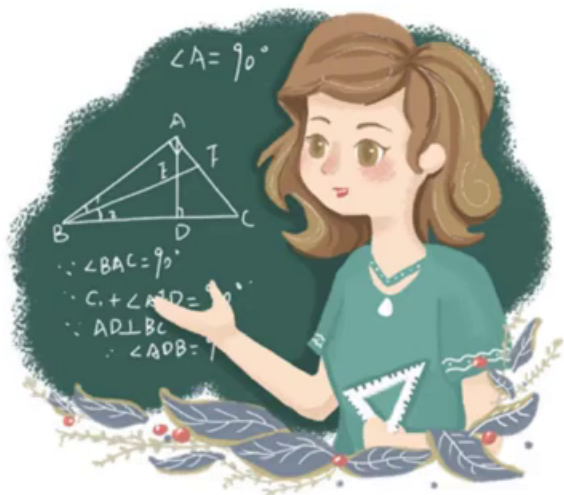
Geometric progression animated intuition



Geometric progression

In mathematics, a geometric progression, also known as a geometric sequence, is a sequence of numbers where each term after the first is found by multiplying the previous one by a fixed, non-zero number called the common ratio



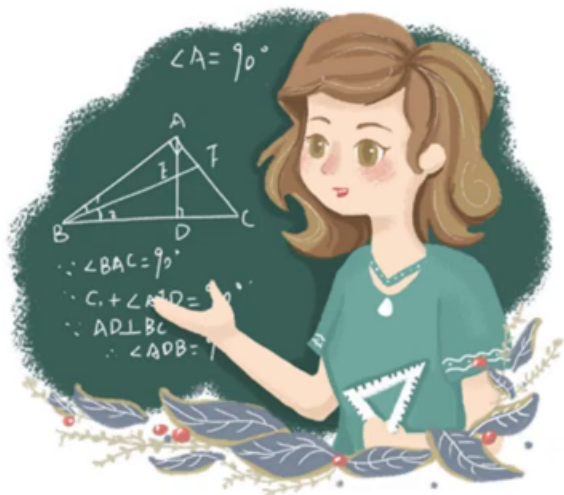
Geometric progression

EX :

1 2 4 8 ratio = 2

EX :

3 9 27 81 ratio = 3



Geometric progression

EX : 2 6 18 54

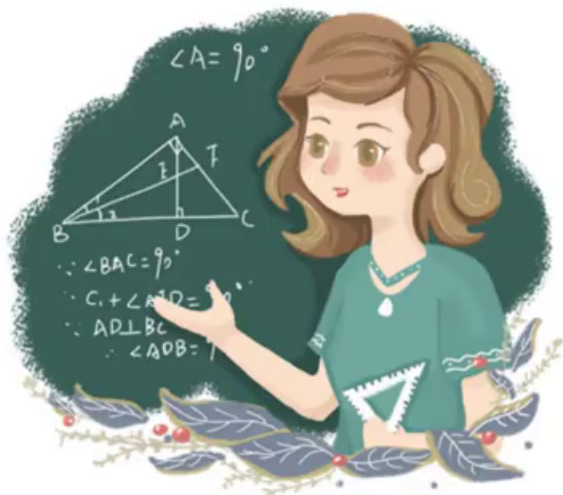
$a1 = 2$

$a2 = 2*3$

$a3 = 2*3^{2}$

$a4 = 2*3^{3}$

$an = a1*r^{n-1}$ (1)



Geometric progression

2 6 18 54 suppose

$a\ ar\ ar^2\ ar^3$ sn = sum

r = ratio

$$S_n = a + ar + ar^2 + \dots + ar^{n-1}$$

$$-rS_n = -ar - ar^2 - ar^3 - \dots - ar^n$$

$$S_n - rS_n = a - ar^n \quad S_n = \frac{a(1-r^n)}{(1-r)} \quad (2)$$