Ap Gp

① 3, 5, 7, 9, 11, 13 — d = 2 (→ difference)

Arithmetic Progression → The difference b/w any 2 consecutive terms is the same as common difference

$$T_3 - T_2 = T_2 - T_1 = T_{500} - T_{499} = d$$

④ 2, 4, 8, 16, 32, 64, 128 — r = 2 (×2 ×2 ×2)

⑤ 81, 27, 9, 3, 1, 1/3 — r = 1/3 (×1/3 ×1/3)

⑥ 100, 10, 1, 0.1, 0.01, 0.001 — r = 1/10 (×1/10 ×1/10)

Geometric Progression: Ratio b/w any two consecutive terms is the same

$$r = \left[\frac{T_2}{T_1} = \frac{T_3}{T_2}\right]$$

r → common ratio.

Finding the n^{th} term in an Arithmetic Progression (T_n)

$T_1, T_2, T_3, T_4, T_5 \ldots\ldots T_{50}, \ldots\ldots T_p = 201$

1, 3, 5, 7, 9

$T_n = a + (n-1)d$ → formula

$T_{50} = ??$

a = first term (1)

d = difference (2)

n = The term no.

$T_n = a + (n-1)d$

$= 1 + (50-1)2$

$= 1 + (49)2$

$= 1 + 98$

$= 99$

$T_p = a + (n-1)d$

$201 = 1 + (n-1)2$

$200 = 2n - 2$

$198 = 2n$

$99 = n$

Sum of n terms

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

a = first term
d = difference
n = the term number

a = first term
n = no. of terms
l = last term

$l = 5, 9, 13, 17$

S_{20} = Sum of first 20 terms

$S_n = \frac{20}{2}[2(5)+(20-2)4]$

$= 10[10+76]$

$= 10[86]$

$= \boxed{860}$

Qs2 $11, 15, 19 \ldots . 47$ (T_{10})

$S_{10} = ??$

$S_n = \frac{n}{2}(a+l)$

$S_n = \frac{10}{2}(11+49)$

$S_n = 5(58)$

$S_{10} = 290$

Finding the number of terms

Find the number of multiple of 4 from 100-250

$100, 104, 108, 112 \ldots . 248$

$n = \frac{l-a}{d}+1$

$n = \frac{248-100}{4}+1$

$n = \frac{148}{4}+1$

$= 37+1$

$= \boxed{38}$

2. Find the number of all the two digit multiples of 3

12 99

$n = \frac{l - a}{d} + 1$

$= \frac{99 - 12}{3} + 2$

$= \frac{87}{3} + 1$

$= 29 + 1$

$= 30$

Geometric Progression

→ Finding the n^{th} term

$T_n = ar^{n-1}$

a = first term

r = common ratio

n = required term