

CHAPTER 06

Progressions

Example:

Which of the following lists of numbers form G.P?

- (i) 3, 6, 12 (ii) $\frac{1}{64}, \frac{1}{32}, \frac{1}{8}, \dots$

Sol.

- (i) Given list of numbers is 3, 6, 12... ($a_1, a_2, a_3, \dots$)

If each term is non-zero and $\frac{a_2}{a_1} = \frac{a_3}{a_2} = \dots = \frac{a_n}{a_{n-1}} = r$.

Here all the terms are non-zero.

$$\frac{a_2}{a_1} = \frac{6}{3} = 2; \quad \frac{a_3}{a_2} = \frac{12}{6} = 2$$

$$\Rightarrow \frac{a_2}{a_1} = \frac{a_3}{a_2} = 2$$

So, the given list of numbers forms a G.P with the common ratio '2'.

- (ii) Given list of numbers is $\frac{1}{64}, \frac{1}{32}, \frac{1}{8}, \dots$ ($a_1, a_2, a_3, \dots$)

All the terms are non-zero.

$$\frac{a_2}{a_1} = \frac{\frac{1}{32}}{\frac{1}{64}} = \frac{1}{32} \times \frac{64}{1} = \frac{64}{32} = 2$$

$$\frac{a_3}{a_2} = \frac{\frac{1}{8}}{\frac{1}{32}} = \frac{1}{8} \times \frac{32}{1} = \frac{32}{8} = 4$$

Here, $\frac{a_2}{a_1} \neq \frac{a_3}{a_2}$.

So, the given list of number does not form G.P.

