Solutions Of Geometric Progressions Ex 20.1 Q 7

$18, -12, 8, \ldots$ is $\frac{512}{729}$

$$a = 18,\ n = ?,\ t_n = \frac{512}{729},\ r = \frac{t_{n-1}}{t_n}$$

$$r = \frac{t_2}{t_1} = \frac{-12}{18} = \frac{-2}{3}$$

Also,

$$t_n = ar^{n-1}$$

$$\frac{512}{729} = (18)\left(\frac{-2}{3}\right)^{n-1}$$

$$\frac{2^9}{36} \times \frac{1}{2 \times 3^2} = \left(\frac{-2}{3}\right)^{n-1}$$

$$\left(\frac{2}{3}\right)^8 = (-1)^{n-1}\left(\frac{2}{3}\right)^{n-1}$$

$$n = 9$$

Solutions Of Geometric Progressions Ex 20.1 Q 8

$\frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \frac{1}{54}, \ldots, \frac{1}{4374}$

$$a = \frac{1}{2},\ l = \frac{1}{4374},\ r = \frac{t_n}{t_{n-1}} = \frac{t_2}{t_1} = \frac{\frac{1}{6}}{\frac{1}{2}} = \frac{1}{3}$$

Term from the end is

$$a_n = l\left(\frac{1}{r}\right)^{n-1}$$

$$t_4 = \left(\frac{1}{4374}\right)(3)^{n-1}$$

$$= \frac{1}{4374} \times 3^3$$

$$= \frac{1}{162}$$

$\therefore$ 4^{th} term from the end is $\frac{1}{162}$.

Solutions Of Geometric Progressions Ex 20.1 Q 9

$t_4 = 27$

$t_7 = 729$

We know that $t_n = ar^{n-1}$

$$t_4 = ar^3 = 27$$

$$t_7 = ar^6 = 729$$

Now,

$$\frac{t_7}{t_4} = \frac{ar^6}{ar^3} = r^3 = \frac{729}{27}$$

$$r^3 = \left(\frac{9}{3}\right)^3$$

$$r^3 = 3^3$$

$$r = 3$$

$$t_4 = ar^3 = 27$$

$$a(3)^3 = 27$$

$$a(27) = 27$$

$$a = 1$$

Now G.P is $a, ar, ar^2, \ldots$

$$1, 3, 9, \ldots$$

Solutions Of Geometric Progressions Ex 20.1 Q 10

$t_7 = 8t_4$

$t_5 = 48$

We know that $t_n = ar^{n-1}$

a = first term

r = common ratio

n = number of terms

$$t_7 = ar^6 = 8\left(ar^3\right)$$

$$r^3 = 8$$

$$r = 2$$

Also,

$$t_5 = 48$$

$$ar^4 = 48$$

$$a(2)^4 = 48$$

$$a = \frac{48}{16} = 3$$

$\therefore$ G.P is $a, ar, ar^2, \ldots$

$3, 6, 12, \ldots$

********** END **********