# Brain International School

Vikas Puri, New Delhi

## ASSIGNMENT NO. 4

**SUBJECT: MATHEMATICS CLASS-XI oct,2025**

## Chapter sequences and series , straight lines

**Ques 1** If a is A.M of b and c and the two geometric means are $G_1$ *and* $G_2$, prove that ${G_1}^3 + {G_2}^3 = 2abc$.

**Ques 2** If G is the geometric mean between a and b show that $\frac{1}{G^2-a^2} + \frac{1}{G^2-b^2} = \frac{1}{G^2}$

**Ques 3.** If one G.M G and two two A.M p and q be inserted between two positive numbers show that $G^2 = (2p-q)(2q-p)$.

**Ques 4** Show that the product of n GM's between two given numbers is equal to the $n^{th}$ power of single G.M.

**Ques 5** The product of three numbers in G.P is 8 and the sum of the numbers, taken in pairs is 14. Find the numbers.

**Ques 6** If the first term of G.P is 4, then find the product of its first 5 terms?

**Ques 7** Find the value of x for which the points (x, – 1), (2,1) and (4, 5) are collinear.

**Ques 8** Let S be the sum, P the product and R the sum of reciprocals of n terms in a GP. Prove that $P^2R^n = S^n$.

**Ques 9** The sum of some terms of G.P is 315 whose first term and the common ratio are 5 and 2, respectively. Find the last term and the number of terms.

**Ques 10** The first term of a G.P is 1. The sum of the third term and fifth term is 90. Find the common ratio of G.P

**Ques 11**The sum of three numbers in G.P is 56. If we subtract 1, 7, 21 from these numbers in that order, we obtain an arithmetic progression. Find the numbers.

**Ques 12**If three points (h, 0), (a, b) and (0, k) lie on a line, show that $\frac{a}{k} + \frac{b}{k} = 1$

**Ques 13** Passing through $(2, 2\sqrt{3})$ and inclined with the x-axis at an angle of $75^o$.

**Ques 14** Find the points on the x-axis, whose distances from the line $\frac{x}{3} + \frac{y}{4} = 1$ are 4 units

**Ques 15** Find the equation of a line passing through the intersection of lines x-3y+1=0, 2x+5y-9=0 and whose distance from the origin is 2 units.

**Ques 16** Find the ration in which the line joining (2, 3) and (4, 1) divides the line joining (1, 2) and (4, 3). Also find the coordinates of point of intersection.

**Ques 17**The first and second terms of a G.P. are $x^{-4}$ and $x^m$ respectively. If its 8th term is $x^{52}$, then the value of m is

(a) 8 (b) 6 (c) 4 (d) 2

**Ques18** If the first term of a G.P. is 27 and 8th term is $\frac{1}{81}$, then the sum of its first 10 terms is

(a) $\frac{27}{2}\left(1-\frac{1}{3^{10}}\right)$ (b) $\frac{81}{2}\left(\frac{1}{3^{10}}-1\right)$ (c) $\frac{27}{2}\left(\frac{1}{3^{10}}-1\right)$ (d) $\frac{81}{2}\left(1-\frac{1}{3^{10}}\right)$

**Ques 19** If 3rd, 8th and 13th terms of a G.P. are p, q and r respectively, then which one of the following is correct?

(a) $q^2=pr$ (b) $r^2=pq$ (c) $pqr=1$ (d) $2q=p+r$

**Ques20** If the second term of a G.P. is 2 and the sum of its infinite terms is 8, then G.P is

(a) $8,2,\frac{1}{2},\frac{1}{8},\ldots$ (b) $10,2,\frac{2}{5},\frac{2}{25},\ldots.$ (c) $4,2,1,\frac{1}{2},\frac{1}{4},\ldots.$ (d) $6,3,\frac{3}{2},\frac{3}{4},\ldots$

**Ques21** If x, y, z are positive integers terms, then the value of the expression $(x+y)(y+z)(z+x)$ is

(a) 8xyz (b) > 8xyz (c) < 8xyz (d) 4xyz

**Ques22** The value of $9^{\frac{1}{3}}\times 9^{\frac{1}{9}}\times 9^{\frac{1}{27}}\times \ldots to\ \infty$ is

(a) 1 (b) 3 (c) 9 (d) none

**~Ques23** The point on the y-axis which is equidistant from the points (3, 2) and (-5, -2) is

(a) (-2, 0) (b) (0, -2) (c) (0, -1) (d) (-1, 0)

**Ques24** A circle of diameter 20 units passes through the point (-3, -1). If the centre of a circle is $(2\alpha-1,\ 3\alpha+1)$, then natural number $\alpha$ is

(a) 3 (b) 4 (c) 2 (d) 1

**~Ques25** If point C (-4, 1) divides the line segment joining the points A (2, -2) and B in the ratio 3 : 5, then the coordinates of B are

(a) (-14, 6) (b) (6, -14) (c) (-14, -6) (d) (-6, -14)

**~Ques 26** If the points A (-2, -1), B (1, 0), C (a, 3) and D (1, b) form a parallelogram ABCD, then the values of a and b are

(a) -4, -2 (b) -4, 2 (c) 4, 2 (d) 2, -4

**Ques 27** If a line joining the points (-2, 6) and (4, 8) is perpendicular to the line joining the points (8, 12) and (x, 24), then the value of x is

(a) 3 (b) 4 (c) -4 (d) 2

**Ques 28** If the points A (0, 6), B (2, 1) and C (7, 3) are three corners of a square ABCD, then the slope of the diagonal BD is

(a) $\frac{2}{7}$ (b) $\frac{7}{2}$ (c) $\frac{7}{3}$ (d) $-\frac{3}{7}$