

BCM SCHOOL, BASANT AVENUE, DUGRI, LUDHIANA.

AUGUST ASSIGNMENT- 2026-27

CLASS- X (MATHEMATICS)

SECTION –A (MULTIPLE CHOICE QUESTIONS)

1. The $(n - 1)^{\text{th}}$ term of an A.P. is given by 7, 12, 17, 22, ... is
 (a) $5n + 2$ (b) $5n + 3$ (c) $5n - 5$ (d) $5n - 3$
2. The coordinates of mid-point P which divides the line joining the points $A(a + 2, b - 2)$ and $B(-a - 2, b - 2)$ is:
 (A) $(a, b - 2)$ (B) $(0, b - 2)$ (C) $(0, b)$ (D) $(0, -2)$
3. If the roots of $px^2 + qx + 2 = 0$ are reciprocal of each other, then
 (a) $P = 0$ (b) $p = -2$ (c) $p = \pm 2$ (d) $p = 2$
4. Assertion: In a right $\triangle ABC$, right angled at B, if $\tan A = 1$, then $2\sin A \cdot \cos A = 1$
 Reason: cosec A is the abbreviation used for cosecant of angle A.
 (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
 (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
 (c) Assertion (A) is true but reason (R) is false.
 (d) Assertion (A) is false but reason (R) is true.

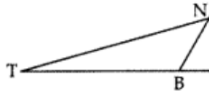
SECTION B(2 MARKS QUESTIONS)

5. If m times the mth term of an AP is equal to n times the nth term, then show that its $(m+n)^{\text{th}}$ term is zero.
6. If $\tan \theta + \sin \theta = m$ and $\tan \theta - \sin \theta = n$, show that $m^2 - n^2 = 4\sqrt{mn}$.

SECTION – C (3 MARKS QUESTIONS)

7. If the roots of the equation $(a^2 + b^2)x^2 - 2(ac + bd)x + (c^2 + d^2) = 0$ are equal, then prove that $ad = bc$.
8. If two vertices of an equilateral triangle are $(0,0)$ and $(3, \sqrt{3})$, find the third vertex.
9. Prove that: $2(\theta + \theta) - 3(\theta + \theta) + 1 = 0$

SECTION – D (5 MARKS QUESTIONS)

10. The lower window of a house is at a height of 2 m above the ground and its upper window is 4 m vertically above the lower window. At certain instant the angles of elevation of a balloon from these windows are observed to be 60° and 30° , respectively. Find the height of the balloon above the ground
11. Any point X is taken on the side BC of a triangle ABC and XM, XN are drawn parallel to BA, CA meeting CA, BA at M and N respectively. MN meets BC produced in T. Prove that: $TX^2 = TB \times TC$.

12. The angle of elevation of cloud from a point 60 m above the surface of lake is 30° and the angle of depression of the reflection of cloud in the lake is 60° . Find the height of the cloud from the surface of water.

SECTION – E (CASE STUDY)

13. **CASE STUDY:**
 In an auditorium seats were arranged in rows and columns. The number of rows were equal to the number of seats in each row. When the number of rows were doubled and the number of seats in each row was reduced by 10, the total number of seats increased by 300.
 (A) If x is taken as number of row in original arrangement, then frame the equation that described the situation?

- (B) How many number of rows are there in original arrangement?
 (C) Calculate the number of seats in auditorium in original arrangement and also after re-arrangement?

OR

How many number of columns are there in the auditorium after re-arrangement?

14. CASE STUDY:

In a GPS, The lines that run east-west are known as lines of latitude, and the lines running north-south are known as lines of longitude. The latitude and the longitude of a place are its coordinates and the distance formula is used to find the distance between two places. The distance between two parallel lines is approximately 150 km. A family from Uttar Pradesh planned a round trip from Lucknow (L) to Puri (P) via Bhuj (B) and Nashik (N) as shown in the given figure below.

Based on the above information answer the following questions:

- (A) Find the distance between Lucknow (L) to Bhuj (B).
 (B) If Kota (K), internally divide the line segment joining Lucknow (L) to Bhuj (B) into 3:2 then find coordinate of Kota (K).
 (C) Find a point on y-axis which is equidistant from the points Lucknow and Puri.

OR

Name the type of triangle formed by the places Lucknow, Nashik and Puri.

