INDIAN SCHOOL NIZWA - WORKSHEET

MATHEMATICS
12. Three Dimensional Geometry
Name: _____ Date: 09-11-2025 Class: XI Sec: A

1. Find the point on the Z- axis which is equidistant from the points (1, 5, 7) and (5, 1 -4)

2. Find the value of λ, so that the distance between the points (7, 1, -3) and (4, 5, λ) is 13

3. Find the locus of the point P which moves so that 3PA =2PB where A= (-2, 2, 3) and B= (13, -3, 13)

4. Show that the points (3, -5, 1), (-1,0, 8) and (7, -10, -6) are collinear

5. Name the octants in which the following points lie (7, -1, 5), (-8, -6, -4), (3, 1, 5) (-3, 5, 11) and (7, 3, -8)

6. Find the equation of set of points P such that $PA^2 + PB^2 = 2k^2$, where A and B are the points (3, 4, 5) and (–1, 3, –7), respectively.

7. Are the points A (3, 6, 9), B (10, 20, 30) and C (25, – 41, 5), the vertices of a right angled triangle?

8. The distance of the point P(2,3,5) from the XY-plane is:
a) 2 units b) 3 units c) 5 units d) 1 unit

9. L is the foot of the perpendicular drawn from a point P (6, 7, 8) on the XY-plane, then the coordinates of point L are
(a) (6, 0, 0) (b) (6, 7, 0) (c) (6, 0, 8) (d) None of these

10. The point (– 2, –3, – 4) lies in the
(a) first octant (b) seventh octant (c) second octant (d) eight octant

11. The point on Y-axis which is at a distance √10 from the point (1, 2, 3), is
(a) (0, 2, 0) (b) (0, 0, 2) (c) (0, 0, 3) (d) None of these

12. If the distance between the points (a, 0, 1) and (0, 1, 2) is √27, then the value of a is
(a) 5 (b) ± 5 (c) − 5 (d) None of these

13. If the point A (3, 2, 2) and B (5, 5, 4) are equidistant from P, which is on X-axis, then the coordinates of P are
(a) (39/4, 2 , 0) (b) (49/4, 2 , 0) (c) (39/4, 0 , 0) (d) (49/4, 0 , 0)

14. The points (5, –1, 1), (7, – 4, 7), (1, – 6, 10) and (−1, − 3, 4) are

(a) the vertices of a rectangle
(b) the vertices of a square
(c) the vertices of a rhombus
(d) None of these

15. (a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

Assertion (A): The points A(3, –1, 2), B(1, 2, – 4), C(–1, 1, 2) and D(1, –2, 8) are the vertices of a parallelogram.
Reason (R): Coordinates of mid-point of a line joining the points $A(x_1, y_1, z_1)$ and $B(x_2, y_2, z_2)$ is $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}, \frac{z_1+z_2}{2}\right)$

16. **Assertion (A):** The distance between the points $(1 + \sqrt{11}, 0, 0)$ and (1, –2, 3) is $2\sqrt{6}$ units.
Reason (R): Distance between any two points $A(x_1, y_1, z_1)$ and $B(x_2, y_2, z_2)$ is,
$|AB| = \sqrt{(x_2 + x_1)^2 + (y_2 + y_1)^2 + (z_2 + z_1)^2}$

17. Find the point on y-axis which is equidistant from the point A(3, 2, 2) and B(5, 5, 4).

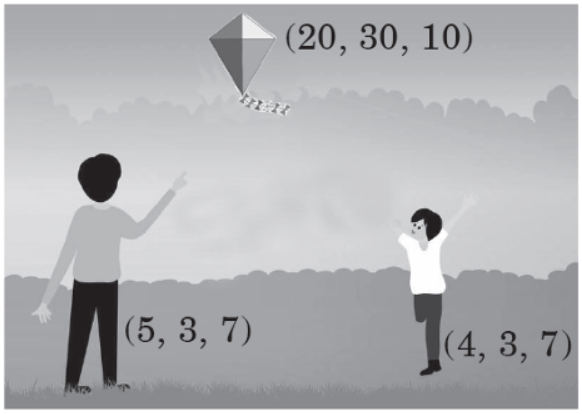
18. Show that the points A(0, 7, 10), B(–1, 6, 6) and C(–4, 9, 6) form an isosceles right-angled triangle.

19. A point R with x-coordinate 4 lies on the line segment joining the points P(2, –6, 4) and Q(8, 6, 10). Find the coordinates of the point R.

20. Find the equation of the set of points which are equidistant from the points (1, 2, 3) and (3, 2, –1).

21. The midpoints of the sides of a triangle are (1, 5, −1), (0, 4, −2) and (2, 3, 4). Find its vertices.

22. Raj and his father were walking in a large park. They saw a kite flying in the sky. The position of kite, Raj and Raj's father are at (20, 30, 10), (4, 3, 7) and (5, 3, 7) respectively.



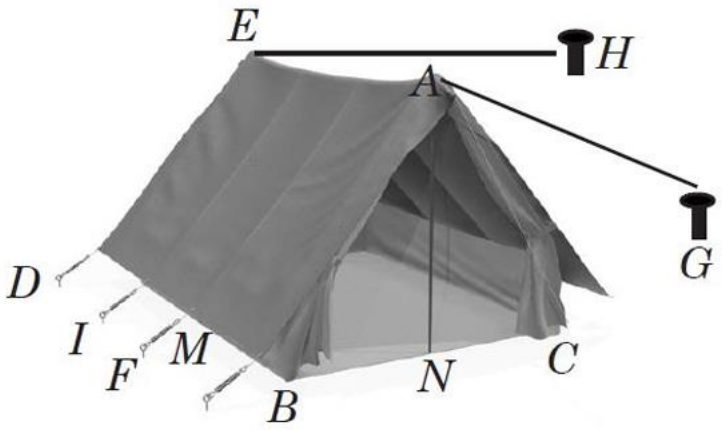
On the basis of above information, answer the following:

(i) Find the distance between Raj and kite. Also find the distance between Raj's father and kite. (2)

(ii) Find the form of the co-ordinates of points in the XY-plane (1)

(iii) If co-ordinates of kite, Raj and Raj's father form a triangle, then find the centroid of it. (1)

23. Deepak and his friends went for camping for 2 or 3 days. There they set up a tent which is triangular in shape. The vertices of the tent are A(4, 5, 9), B(3, 2, 5), C(5, 2, 5), D(–3, 2, –5) and E(–4, 5, –9) respectively. The vertex A is tied up by the rope at the ends F and G and the vertex E is tied up at the ends I and H.



On the basis of above information, answer the following:

(i) If M denotes the position of their bags inside the tent and it is just in middle of the vertices B and D, then find the coordinates of M. (1)

(ii) Find the length AE. (1)

(iii) If the length of the rope by which E is tied up with H is $5\sqrt{2}$ units, then the equation denotes the set of point of H (2)