CLASS IX – MATHEMATICS

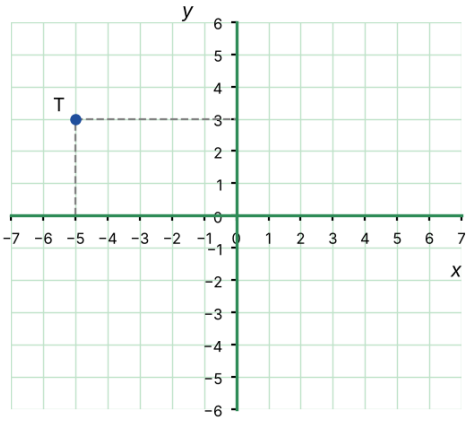
Chapter Test: Orienting Yourself – The Use of Coordinates

(Ganita Manjari, Grade 9, Part I – Chapter 1)

Time: 1½ Hours **M. M.: 40**

General Instructions:

1. This paper contains 21 questions. All questions are compulsory.
2. This paper is divided into 5 sections: **A, B, C, D** and **E**.
3. In **Section A**, Questions no. **1** to **10** are MCQs and questions no. **11** and **12** are Assertion-Reason based questions of 1 mark each.
4. In **Section B**, Questions no. **13** to **16** are Very Short Answer type questions carrying 2 marks each.
5. In **Section C**, Questions no. **17** and **18** are Short Answer type questions carrying 3 marks each.
6. In **Section D**, Questions no. **19** and **20** are Long Answer type questions carrying 5 marks each.
7. In **Section E**, Question no. **21** is a case based question carrying 4 marks. Internal choice is provided in the 2 marks part of the case study.
8. There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Section C, 2 questions in Section D and 1 part of Section E.
9. Draw neat figures / graphs wherever required. Leave answers in surd form (like $2\sqrt{5}$) unless stated otherwise.
10. Use of calculator is **not** allowed.

Q. No.	Section – A	Marks
1.	The point $(-4, 0)$ lies on the (A) positive x-axis (B) negative x-axis (C) positive y-axis (D) negative y-axis	**[1]**
2.	For every real number k, the point $(-2, k^2 + 1)$ lies in (A) Quadrant I (B) Quadrant II (C) Quadrant III (D) Quadrant IV	**[1]**
3.	The perpendicular distance of the point $(-6, 8)$ from the y-axis is (A) 6 units (B) -6 units (C) 8 units (D) 10 units	**[1]**
4.	The distance between the points $(3, -2)$ and $(3, 9)$ is (A) 7 units (B) 11 units (C) 5 units (D) 12 units	**[1]**
5.	The distance of the point $(5, -12)$ from the origin is (A) 7 units (B) 17 units (C) 13 units (D) 169 units	**[1]**
6.	In the figure, the point T is reflected in the x-axis. The coordinates of its image are  (A) $(-5, -3)$ (B) $(5, 3)$ (C) $(5, -3)$ (D) $(3, -5)$	**[1]**
7.	The mid-point of the line segment joining $(-2, 7)$ and $(8, -3)$ is (A) (3, 2) (B) (5, 2) (C) (3, 5) (D) (6, 4)	**[1]**

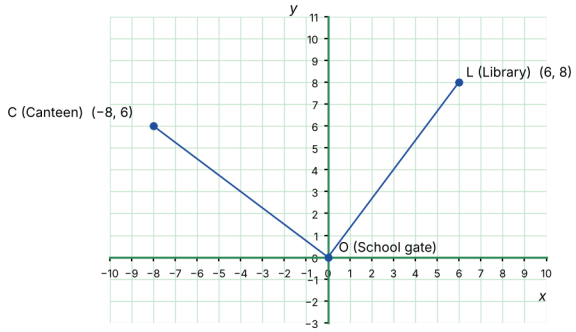
Q. No.	Section – A	Marks
8.	If the point $(2k - 8, 5)$ lies on the y-axis, then the value of k is (A) 2 (B) 4 (C) −4 (D) 8	**[1]**
9.	Which of the following points is the farthest from the origin? (A) (3, 4) (B) (−5, 1) (C) (0, −5) (D) (−4, −3)	**[1]**
10.	A circle has its centre at the origin and radius 10 units. Which of the following points lies **inside** the circle? (A) (6, 8) (B) (−8, −7) (C) (7, 7) (D) (10, 1)	**[1]**
	Questions number 11 and 12 are Assertion and Reason based questions. Two statements are given, one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer from the options (A), (B), (C) and (D) as given below. (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 and 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.	
11.	**Assertion (A):** The points (2, 3) and (3, 2) represent the same point in the Cartesian plane. **Reason (R):** $(x, y) = (y, x)$ if and only if $x = y$.	**[1]**
12.	**Assertion (A):** The points (1, 2), (2, 4) and (3, 6) are collinear. **Reason (R):** Three points P, Q and R are collinear if PQ + QR = PR.	**[1]**

Q. No.	Section – B	Marks
13.	Find the coordinates of the point on the x-axis which is equidistant from the points (2, 3) and (4, −5).	**[2]**
14.	(A) The point P(−5, 7) is reflected in the x-axis to get P′ and in the y-axis to get P″. Write the coordinates of P′ and P″ and find the distance P′P″. **OR** (B) State the quadrant or the axis in which each of the following points lies: (−3, 5), (4, −1), (0, −6), (−2, −7).	**[2]**
15.	M(2, −3) is the mid-point of the line segment joining P(−4, 5) and Q(x, y). Find the coordinates of Q.	**[2]**
16.	(A) Check whether the point (9, −12) lies inside, on or outside the circle with centre at the origin and radius 14 units. **OR** (B) Find the values of k for which the distance between the points $(k, 3)$ and (2, −1) is 5 units.	**[2]**

Q. No.	Section – C	Marks
17.	(A) Show that the points A(2, 1), B(5, 4) and C(−1, 4) are the vertices of an isosceles right-angled triangle. **OR** (B) The points P and Q divide the line segment joining A(−3, 8) and B(9, −1) into three equal parts, with P closer to A. Find the coordinates of P and Q.	**[3]**

Q. No.	Section – C	Marks
18.	(A) Using the distance formula, show that the points A(−3, −1), B(0, 1) and C(6, 5) are collinear. Also find the ratio AB : BC. **OR** (B) Find the coordinates of the point on the y-axis which is equidistant from the points (5, −2) and (−3, 2).	**[3]**

Q. No.	Section – D	Marks
19.	(A) The vertices of a quadrilateral ABCD are A(2, −1), B(5, 3), C(1, 6) and D(−2, 2). Show that ABCD is a square and find its area. **OR** (B) (i) Show that the points A(5, 12), B(−12, 5) and C(13, 0) lie on a circle whose centre is the origin O. Find its radius. (ii) Check whether the points E(9, 10) and F(−6, −11) lie inside, on or outside this circle.	**[5]**
20.	(A) On a graph paper (scale: 1 cm = 1 unit), plot the points P(−4, 3), Q(2, 3), R(2, −1) and S(−4, −1) and join them in order. Name the figure PQRS. Find its perimeter, its area and the length of its diagonal PR. **OR** (B) The points D(2, −1), E(5, 1) and F(−1, 3) are the mid-points of the sides BC, CA and AB of a triangle ABC respectively. Find the coordinates of the vertices A, B and C.	**[5]**

Q. No.	Section – E	Marks
21.	**Case Study:** A school campus is drawn on a coordinate grid, with the **school gate at the origin O (0, 0)**. The Library L is at (6, 8) and the Canteen C is at (−8, 6). One unit on the grid represents 10 metres on the ground.  (i) How far is the Library from the school gate? Give the answer in metres. **[1]** (ii) Show that the Library and the Canteen are at the same distance from the school gate. **[1]** (iii) (A) Find the straight-line distance between the Library L and the Canteen C. (Take √2 = 1.41) **[2]** **OR** (iii) (B) A fountain F is to be built exactly midway between the Library and the Canteen. Find the coordinates of F and its distance from the school gate (in grid units). **[2]**	**[4]**