# PRACTICE PAPER 01 (2026-27)
## CHAPTER 01
## Orienting Yourself: The Use of Coordinates

**SUBJECT: MATHEMATICS** **MAX. MARKS : 40**
**CLASS : IX** **DURATION : 1½ hrs**

**General Instructions:**
(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). Use of Calculators is not permitted

## SECTION – A
**Questions 1 to 10 carry 1 mark each.**

**1.** The point $(5,-7)$ lies in:
(a) First quadrant (b) Second quadrant (c) Third quadrant (d) Fourth quadrant

**2.** Which point lies on the x-axis?
(a) (0,6) (b) (5,0) (c) $(-3,4)$ (d) $(2,7)$

**3.** Which point is equidistant from the x-axis and y-axis?
(a) (3,3) (b) (4,5) (c) (-2,3) (d) (5,0)

**4.** If a point is 4 units away from the origin along the x-axis, it can be:
(a) (4,0) or (-4,0) (b) (0,4) or (0,-4) (c) (3,3) or (-3,-3) (d) (2,2) or (-2,-2)

**5.** Which point lies in the second quadrant?
(a) (6,3) (b) (-4,5) (c) (-5,-6) (d) (3,-7)

**6.** The distance between points $(-2,-3)$ and $(-2,4)$ is:
(a) 5 (b) 6 (c) 7 (d) 8

**7.** Which of the following points is the midpoint of (-3,5) and (1,1)?
(a) (-1,3) (b) (-2,2) (c) (1,3) (d) (0,2)

**8.** Which point lies in the third quadrant?
(a) (4,6) (b) (-3,5) (c) (-4,-7) (d) (6,-2)

**In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.**
(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.

**9.** **Assertion:** Distance between $(1,4)$ and $(1,10)$ is 6.
**Reason:** If two points have the same x-coordinate, distance equals the difference of y-coordinates.

**10. Assertion:** Midpoint of $(2,8)$and (6, 4) is $(4,6)$.
**Reason:** Midpoint formula is $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$.

## SECTION – B

**Questions 11 to 14 carry 2 marks each.**

**11.** The coordinates of two towns are $A(3,5)$and $B(-1,9)$. A courier wants to go from A to B in a straight path. Find the distance between the two towns.

**12.** A park has two entrances at $P(2,1)$and $Q(8,5)$. A security guard walks along the straight path joining the entrances. Find the distance he walks.

**13.** Find the point on the x-axis which is equidistant from $(2,-5)$and $(-2,9)$.

**14.** Find the value(s) of $y$ such that distance between $P(2,-3)$and $Q(10,y)$is 10 units.

## SECTION – C

**Questions 15 to 17 carry 3 marks each.**

**15.** Check whether the points $A(2,3)$, $B(6,7)$, $C(10,11)$are collinear.

**16.** Show that the triangle with vertices $A(1,2)$, $B(5,2)$, $C(5,5)$is right-angled.

**17.** Find the midpoint of $A(-2,4)$and $B(6,10)$and verify that the midpoint divides the line segment equally.

## SECTION – D

**Questions 18 carry 5 marks each.**

**18.** Show that the points $A(1,1)$, $B(5,1)$, $C(5,5)$, $D(1,5)$are the vertices of a square.

## SECTION – E (Case Study Based Questions)

**Questions 19 to 20 carry 4 marks each.**

**19. Case Study 1 - Village Well Planning**

A village is planning to dig a new well at a central location so that all surrounding houses are equidistant from it. The houses are located at points $A(2,3)$, $B(6,3)$, and $C(4,7)$on a coordinate grid representing the village map. The village council wants to check whether these three houses lie in a straight line so that the well can be placed equidistantly. If they are not collinear, the council wants to find the midpoint of the line segment joining the two farthest houses to locate the well.

**Answer the following questions:**

(a) Check whether the points $A, B, C$ are collinear. (2)

(b) Identify the two farthest houses. (1)

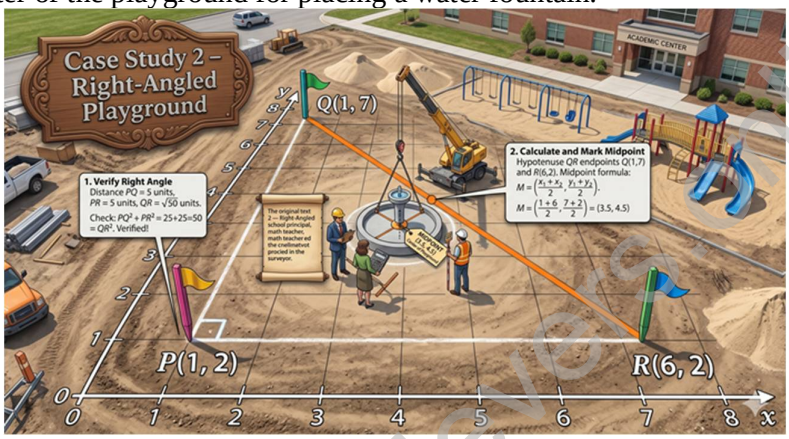
(c) Find the midpoint of the line joining the two farthest houses. (1)

**OR**

(c) Calculate the distance between the two farthest houses and give coordinates of the well. (1)

**20. Case Study 2 - Right-Angled Playground**

A school is designing a rectangular playground. The corners of the playground are marked at $P(1,2)$, $Q(1,7)$, and $R(6,2)$ on the school's coordinate map. The principal wants to ensure that the playground is **right-angled** so that sports can be played efficiently. He asks the math teacher to verify whether $\triangle PQR$ forms a right-angled triangle and to calculate the midpoint of the hypotenuse to mark the center of the playground for placing a water fountain.




**Answer the following questions:**

(a) Verify whether $\triangle PQR$ is right-angled. (2)

(b) Determine which side is the hypotenuse. (1)

(c) Find the midpoint of the hypotenuse. (1)

**OR**

(c) Give coordinates of the playground center. (1)

# PRACTICE PAPER 01 (2026-27)
## CHAPTER 01
## Orienting Yourself: The Use of Coordinates
### (ANSWERS)

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(iv). There is no overall choice.
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## SECTION – A
**Questions 1 to 10 carry 1 mark each.**

**1.** The point $(5,-7)$ lies in:
(a) First quadrant (b) Second quadrant (c) Third quadrant (d) Fourth quadrant
Ans. (d) Fourth quadrant
$x = 5 > 0, y = -7 < 0 \implies$ fourth quadrant

**2.** Which point lies on the x-axis?
(a) (0,6) (b) (5,0) (c) $(-3,4)$ (d) $(2,7)$
Ans. (b) (5,0)
Condition: $y = 0 \implies (5,0)$

**3.** Which point is equidistant from the x-axis and y-axis?
(a) (3,3) (b) (4,5) (c) (-2,3) (d) (5,0)
Ans. (a) (3,3)
Equidistant from axes: $|x| = |y| \implies (3,3)$

**4.** If a point is 4 units away from the origin along the x-axis, it can be:
(a) (4,0) or (-4,0) (b) (0,4) or (0,-4) (c) (3,3) or (-3,-3) (d) (2,2) or (-2,-2)
Ans. (a) (4,0) or (-4,0)
Distance from origin along x-axis: $y = 0, x = \pm 4$
$\implies$ (4,0) or (-4,0)

**5.** Which point lies in the second quadrant?
(a) (6,3) (b) (-4,5) (c) (-5,-6) (d) (3,-7)
Ans. (b) (-4,5)
$x < 0, y > 0 \implies (-4,5)$

**6.** The distance between points $(-2,-3)$ and $(-2,4)$ is:
(a) 5 (b) 6 (c) 7 (d) 8
Ans. (c) 7
$AB = \sqrt{(-2+2)^2 + (4+3)^2} = \sqrt{0 + 7^2} = 7$

**7.** Which of the following points is the midpoint of (-3,5) and (1,1)?
(a) (-1,3) (b) (-2,2) (c) (1,3) (d) (0,2)
Ans. (a) (-1,3)
$M = \left(\frac{-3+1}{2}, \frac{5+1}{2}\right) = (-1,3)$

**8.** Which point lies in the third quadrant?
(a) (4,6) (b) (-3,5) (c) (-4,-7) (d) (6,-2)
Ans. (c) (-4,-7)
$x < 0, y < 0 \implies (-4,-7)$

**In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.**
(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.

**9.** **Assertion:** Distance between $(1, 4)$ and $(1, 10)$ is $6$.
**Reason:** If two points have the same x-coordinate, distance equals the difference of y-coordinates.
Ans. (a) Both A and R are true and R is the correct explanation of A.
$AB = \sqrt{(1-1)^2 + (10-4)^2} = \sqrt{36} = 6$

**10.** **Assertion:** Midpoint of $(2, 8)$ and (6, 4) is $(4, 6)$.
**Reason:** Midpoint formula is $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$.
Ans. (a) Both A and R are true and R is the correct explanation of A.
$M\left(\frac{2+6}{2}, \frac{8+4}{2}\right) = M(4,6)$

## SECTION – B

**Questions 11 to 14 carry 2 marks each.**

**11.** The coordinates of two towns are $A(3,5)$ and $B(-1,9)$. A courier wants to go from A to B in a straight path. Find the distance between the two towns.
Ans.
$AB = \sqrt{(-1-3)^2 + (9-5)^2} = \sqrt{(-4)^2 + 4^2} = \sqrt{16+16} = \sqrt{32} = 4\sqrt{2}$ units

**12.** A park has two entrances at $P(2,1)$ and $Q(8,5)$. A security guard walks along the straight path joining the entrances. Find the distance he walks.
Ans.
$PQ = \sqrt{(8-2)^2 + (5-1)^2} = \sqrt{36+16} = \sqrt{52} = 2\sqrt{13}$ units

**13.** Find the point on the x-axis which is equidistant from $(2, -5)$ and $(-2,9)$.
Ans. Let $P(x, 0)$
$\sqrt{(x-2)^2 + 25} = \sqrt{(x+2)^2+81} \implies (x-2)^2 + 25 = (x+2)^2 + 81$
$x^2 - 4x + 4 + 25 = x^2 + 4x + 4 + 81 \implies -8x = 56 \implies x = -7$

Hence, Point is $(-7,0)$

**14.** Find the value(s) of $y$ such that distance between $P(2, -3)$ and $Q(10, y)$ is 10 units.
Ans.
$\sqrt{(10-2)^2 + (y+3)^2} = 10 \implies \sqrt{64 + (y+3)^2} = 10$
$(y+3)^2 = 36 \implies y + 3 = 6$ or $-6 \implies y = 3$ or $-9$

## SECTION – C

**Questions 15 to 17 carry 3 marks each.**

**15.** Check whether the points $A(2,3)$, $B(6,7)$, $C(10,11)$ are collinear.

Ans.

$AB = \sqrt{(6-2)^2 + (7-3)^2} = \sqrt{16+16} = \sqrt{32}$,

$BC = \sqrt{(10-6)^2 + (11-7)^2} = \sqrt{16+16} = \sqrt{32}$

$AC = \sqrt{(10-2)^2 + (11-3)^2} = \sqrt{64+64} = \sqrt{128}$

$AB + BC = \sqrt{32} + \sqrt{32} = \sqrt{128} = AC$

Hence, Points are collinear.

**16.** Show that the triangle with vertices $A(1,2)$, $B(5,2)$, $C(5,5)$ is right-angled.

Ans.

$AB = \sqrt{(5-1)^2 + (2-2)^2} = \sqrt{16} = 4$

$BC = \sqrt{(5-5)^2 + (5-2)^2} = \sqrt{9} = 3$

$AC = \sqrt{(5-1)^2 + (5-2)^2} = \sqrt{16+9} = \sqrt{25} = 5$

$AB^2 + BC^2 = 4^2 + 3^2 = 16 + 9 = 25 = AC^2$

Hence, the triangle is Right-angled triangle at B

**17.** Find the midpoint of $A(-2,4)$ and $B(6,10)$ and verify that the midpoint divides the line segment equally.

Ans.

$M = \left(\frac{-2+6}{2}, \frac{4+10}{2}\right) = (2,7)$

$AM = \sqrt{(2+2)^2 + (7-4)^2} = \sqrt{16+9} = 5$

$MB = \sqrt{(6-2)^2 + (10-7)^2} = \sqrt{16+9} = 5$

$\Rightarrow AM = MB$

Hence, Midpoint divides line segment equally.

## SECTION – D

**Questions 18 carry 5 marks each.**

**18.** Show that the points $A(1,1)$, $B(5,1)$, $C(5,5)$, $D(1,5)$ are the vertices of a square.

Ans.

$AB = \sqrt{(5-1)^2 + (1-1)^2} = \sqrt{16} = 4$

$BC = \sqrt{(5-5)^2 + (5-1)^2} = \sqrt{16} = 4$

$CD = \sqrt{(1-5)^2 + (5-5)^2} = \sqrt{16} = 4$

$DA = \sqrt{(1-1)^2 + (1-5)^2} = \sqrt{16} = 4$

Diagonals:

$AC = \sqrt{(5-1)^2 + (5-1)^2} = \sqrt{16+16} = \sqrt{32}$

$BD = \sqrt{(1-5)^2 + (5-1)^2} = \sqrt{16+16} = \sqrt{32}$

$AB = BC = CD = DA, AC = BD \Rightarrow ABCD$ is a square

## SECTION – E (Case Study Based Questions)

**Questions 19 to 20 carry 4 marks each.**

**19. Case Study 1 - Village Well Planning**

A village is planning to dig a new well at a central location so that all surrounding houses are equidistant from it. The houses are located at points $A(2,3)$, $B(6,3)$, and $C(4,7)$on a coordinate grid representing the village map. The village council wants to check whether these three houses lie in a straight line so that the well can be placed equidistantly. If they are not collinear, the council wants to find the midpoint of the line segment joining the two farthest houses to locate the well.


**Answer the following questions:**

(a) Check whether the points $A, B, C$ are collinear. (2)

(b) Identify the two farthest houses. (1)

(c) Find the midpoint of the line joining the two farthest houses. (1)

**OR**

(c) Calculate the distance between the two farthest houses and give coordinates of the well. (1)

Ans.

(a) Check collinearity:

$$AB = \sqrt{(6-2)^2 + (3-3)^2} = \sqrt{16+0} = 4$$

$$BC = \sqrt{(4-6)^2 + (7-3)^2} = \sqrt{(-2)^2 + 4^2} = \sqrt{4+16} = \sqrt{20}$$

$$AC = \sqrt{(4-2)^2 + (7-3)^2} = \sqrt{2^2 + 4^2} = \sqrt{4+16} = \sqrt{20}$$

$AB + BC = 4 + \sqrt{20} \neq AC = \sqrt{20} \implies$ points are not collinear

(b) Identify the two farthest houses:

Distances:

$AB = 4, BC = \sqrt{20}, AC = \sqrt{20}$

$\implies$ Farthest houses are B(6,3) and C(4,7)

(c) Midpoint of line joining the two farthest houses:

$$M = \left(\frac{6+4}{2}, \frac{3+7}{2}\right) = (5,5)$$

**OR**

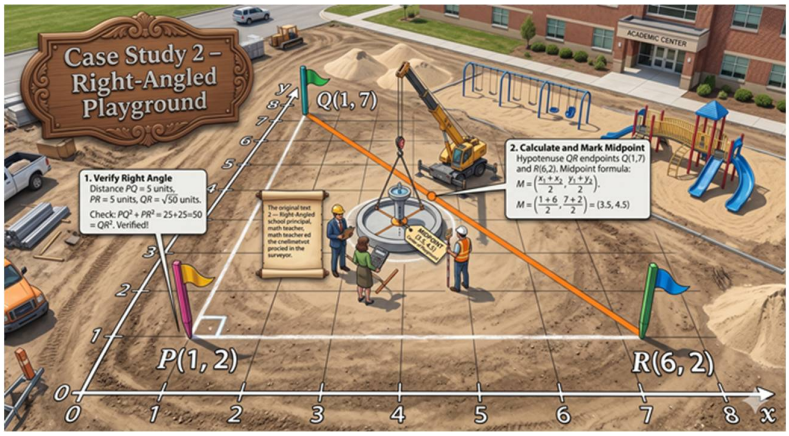
(c) Distance between the two farthest houses & coordinates of well:

$BC = \sqrt{(4-6)^2 + (7-3)^2} = \sqrt{(-2)^2 + 4^2} = \sqrt{4+16} = \sqrt{20}$ units

Well coordinates: $M(5,5)$

**20. Case Study 2 - Right-Angled Playground**

A school is designing a rectangular playground. The corners of the playground are marked at $P(1,2)$, $Q(1,7)$, and $R(6,2)$on the school's coordinate map. The principal wants to ensure that the playground is **right-angled** so that sports can be played efficiently. He asks the math teacher to verify whether $\triangle PQR$forms a right-angled triangle and to calculate the midpoint of the hypotenuse to mark the center of the playground for placing a water fountain.




**Answer the following questions:**

**(a)** Verify whether $\triangle PQR$ is right-angled. (2)

**(b)** Determine which side is the hypotenuse. (1)

**(c)** Find the midpoint of the hypotenuse. (1)

**OR**

**(c)** Give coordinates of the playground center. (1)

**Ans.**

**(a) Verify right angle:**

$PQ = \sqrt{(1-1)^2 + (7-2)^2} = \sqrt{0 + 25} = 5$

$PR = \sqrt{(6-1)^2 + (2-2)^2} = \sqrt{25 + 0} = 5$

$QR = \sqrt{(6-1)^2 + (2-7)^2} = \sqrt{25 + 25} = \sqrt{50} \approx 7.071$

Check Pythagoras:

$PQ^2 + PR^2 = 5^2 + 5^2 = 25 + 25 = 50 = QR^2$

$\Longrightarrow$ $\triangle PQR$ is **right-angled at P**

**(b) Identify hypotenuse:**

Hypotenuse = QR (longest side) = $\sqrt{50} \approx 7.071$ units

**(c) Midpoint of hypotenuse QR:**

$M = \left(\frac{6+1}{2}, \frac{2+7}{2}\right) = \left(\frac{7}{2}, \frac{9}{2}\right) = (3.5, 4.5)$

**OR**

**(c) Coordinates of playground center:**

Center (fountain) at $M(3.5, 4.5)$