Affiliated to CBSE, New Delhi (Affiliation No. 1030642)

GNPS

GOMTI NANDAN PUBLIC SCHOOL

Gandhi Ward, Bina (M.P.) 470113. | 9165 609 333. | info@mygnps.com | www.mygnps.com

CLASS X · MATHEMATICS STANDARD (041) · CBSE BOARD EXAMINATION 2027

CHAPTER 7

Coordinate Geometry

Chapter Practice Booklet · Questions only · Answers in the separate Answer Booklet

60 practice questions | 4 case studies | Board question index | Original diagrams

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STUDENT DETAILS

NAME _____

CLASS & SECTION _____

ROLL NO. _____

BOOKLET STARTED ON _____

CHAPTER TEST SCORE _____ / 20

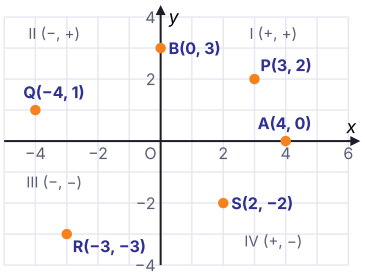
1

READ THIS FIRST

Chapter Notes

The whole chapter in short-note form: every definition, formula, method and model answer. Revise from here – you should not need the textbook again.

1 The coordinate plane



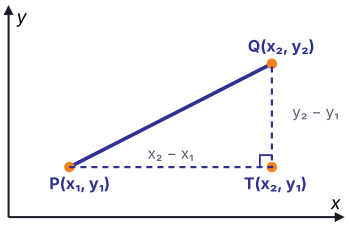
A point is fixed by an ordered pair $(x,\ y)$. x is the **abscissa** (distance from the y-axis) and y is the **ordinate** (distance from the x-axis).

- Signs: Quadrant I $(+,+)$, II $(-,+)$, III $(-,-)$, IV $(+,-)$.
- A point on the x-axis is $(a,\ 0)$; a point on the y-axis is $(0,\ b)$; the origin is $O(0,\ 0)$.
- The distance of $(x,\ y)$ from the x-axis is $|y|$ and from the y-axis is $|x|$.

EXAMPLE

$(-3,\ 5)$: abscissa -3, ordinate 5, Quadrant II, 5 units from the x-axis and 3 units from the y-axis.

2 Distance formula



In right $\triangle PTQ$: $PT = x_2 - x_1$ and $QT = y_2 - y_1$. By Pythagoras, $PQ^2 = PT^2 + QT^2$.

The distance between $P(x_1,\ y_1)$ and $Q(x_2,\ y_2)$ is

$$PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

- The order of the points does not matter, because the differences are squared.
- From the origin: $OP = \sqrt{x^2 + y^2}$.
- On the same horizontal line ($y_1 = y_2$) the distance is just $|x_2 - x_1|$.

EXAMPLE

$A(-1,\ 3)$, $B(5,\ -5)$: $AB = \sqrt{6^2 + (-8)^2} = \sqrt{100} = 10$ units.

3 Using distances: collinear points and types of figures

- **Collinear:** three points lie on one line if the two smaller distances add up to the largest.
- **Triangle:** two sides equal: isosceles · three equal: equilateral · (longest side)² = sum of squares of the other two: right-angled.

Square	4 equal sides and equal diagonals
Rhombus	4 equal sides, diagonals not equal
Rectangle	opposite sides equal and equal diagonals
Parallelogram	opposite sides equal, diagonals not equal

EXAMPLE

$A(1,-1)$, $B(3,\ 3)$, $C(-1,-5)$: $AB = \sqrt{4+16} = 2\sqrt{5}$, $AC = \sqrt{4+16} = 2\sqrt{5}$, $BC = \sqrt{16+64} = 4\sqrt{5}$. $AB + AC = BC$, so the points are collinear.

4 Equidistant points and unknown coordinates

If P is equidistant from A and B, write $PA = PB$ and square both sides: $PA^2 = PB^2$. For a point on the x-axis take $(x,\ 0)$; on the y-axis take $(0,\ y)$.

EXAMPLE

Point on the x-axis equidistant from $A(5,\ -2)$ and $B(-1,\ 4)$: $(x-5)^2+4 = (x+1)^2+16 \to -10x+29 = 2x+17 \to x = 1$. The point is $(1,\ 0)$. Check: both distances are $\sqrt{20}$ ✓

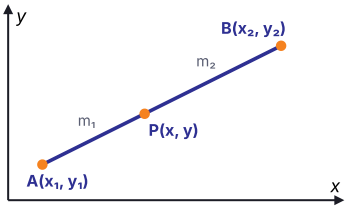
When a distance is given and a coordinate is unknown, square both sides. A square root then gives **two** values ($\pm$): keep both unless the question rules one out.

5 Model answer: unknown coordinate (2 marks)

Find y if the distance between $P(2,\ -3)$ and $Q(10,\ y)$ is 10 units.

1. $\sqrt{(10-2)^2+(y+3)^2} = 10 \to 64+(y+3)^2 = 100$ 1
2. $(y+3)^2 = 36 \to y+3 = \pm 6 \to y = 3$ or $y = -9$ 1

6 Section formula (internal division)



The point P that divides the join of $A(x_1,\ y_1)$ and $B(x_2,\ y_2)$ internally in the ratio $m_1 : m_2$ (so $AP : PB = m_1 : m_2$) is

$$P\left(\frac{m_1x_2+m_2x_1}{m_1+m_2},\ \frac{m_1y_2+m_2y_1}{m_1+m_2}\right)$$

- Cross over: m_1 multiplies the coordinates of B, and m_2 those of A.
- It comes from two similar right triangles with vertical and horizontal sides through A, P and B.

EXAMPLE

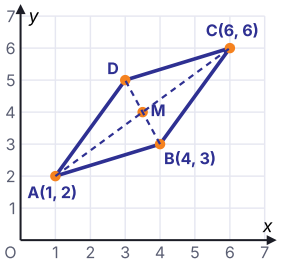
Divide $A(-4,\ 6)$ and $B(6,\ -4)$ in the ratio $3 : 2$: $x = \frac{3(6)+2(-4)}{5} = 2$, $y = \frac{3(-4)+2(6)}{5} = 0$. The point is $(2,\ 0)$.

7 Midpoint, trisection, centroid and parallelograms

Midpoint of AB (ratio $1 : 1$):

$$M\left(\frac{x_1+x_2}{2},\ \frac{y_1+y_2}{2}\right)$$

- **Points of trisection:** use the ratios $1 : 2$ and $2 : 1$.
- **Centroid** of a triangle (where the medians meet, dividing each in $2 : 1$): $G\left(\frac{x_1+x_2+x_3}{3},\ \frac{y_1+y_2+y_3}{3}\right)$.
- **Parallelogram:** the diagonals bisect each other, so the midpoint of AC = the midpoint of BD. The fourth vertex is $D = A + C - B$ (coordinate by coordinate).



EXAMPLE

$A(1,\ 2)$, $B(4,\ 3)$, $C(6,\ 6)$: midpoint of AC is $M(3.5,\ 4)$, so $D = (1+6-4,\ 2+6-3) = (3,\ 5)$.

8 Finding the ratio: the k : 1 method

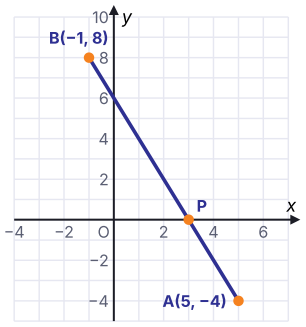
If the ratio is unknown, take it as $k : 1$. Then $P = \left(\frac{kx_2+x_1}{k+1},\ \frac{ky_2+y_1}{k+1}\right)$. Put in the coordinate you know and solve for k.

- Divided by the x**-axis**: the point has $y = 0$. Divided by the y**-axis**: the point has $x = 0$.
- Write the answer as a ratio ($k = \frac{1}{2}$ gives $1 : 2$), then find the point if asked.
- Check with the other coordinate. A negative k means the point is not between A and B.

EXAMPLE

Ratio in which $P(1,\ 3)$ divides $A(-2,\ 6)$ and $B(7,\ -3)$: $\frac{7k-2}{k+1} = 1 \to 6k = 3 \to k = \frac{1}{2}$, so $1 : 2$.
Check y: $\frac{-3(\frac{1}{2})+6}{\frac{3}{2}} = 3$ ✓

9 Model answer: ratio in which an axis divides (3 marks)



Find the ratio in which the x-axis divides the join of $A(5,\ -4)$ and $B(-1,\ 8)$. Also find the point of division.

1. Let the ratio be $k : 1$. The point is $P\left(\dfrac{-k+5}{k+1},\ \dfrac{8k-4}{k+1}\right)$. 1
2. P is on the x-axis, so $\dfrac{8k-4}{k+1} = 0 \rightarrow k = \frac{1}{2}$. The ratio is $1 : 2$. 1
3. $x = \dfrac{1(-1)+2(5)}{3} = 3$, so the point is $(3,\ 0)$. 1

10 Checks that save marks

- Square **each** difference separately: $(x_2 - x_1)^2 + (y_2 - y_1)^2$, then take the root.
- In the section formula, m_1 goes with the second point B.
- Divided by the x-axis means $y = 0$, not $x = 0$.
- Keep both signs after a square root, unless the question rules one out.
- Four equal sides alone do not make a square: check the diagonals too.
- Leave surds simplified: $\sqrt{50} = 5\sqrt{2}$, $\sqrt{45} = 3\sqrt{5}$.

Exam snapshot

What the board asks, and how to prepare

SYLLABUS 2026–27

- Concepts of coordinate geometry and graphs of linear equations.
- **Distance formula.**
- **Section formula** (internal division).

Not asked: the area of a triangle from its vertices (deleted).

BOARD WEIGHTAGE

6 / 80

Unit III Coordinate Geometry is this chapter alone. Every paper checked had exactly 6 marks from it: one or two 1-mark questions (midpoint, distance, assertion–reason), a 2-mark distance question and a 3-mark section-formula question.

MOST ASKED IN BOARD PAPERS, 2024–2026 + SAMPLE PAPER 2026–27 (4 PAPERS CHECKED)

How often	Question type	Marks	Papers
★★★	3 marks: ratio in which an axis or a given point divides a segment, and the point	3	4 of 4
★★★	Distance formula: an unknown coordinate, centre and radius of a circle, equidistant point	1–2	4 of 4
★★★	1 mark: midpoint (which axis it lies on), length of a median, other end of a diameter	1	4 of 4
★☆☆	Show a figure from coordinates (midpoints of a rectangle form a rhombus)	3	1 of 4

MISTAKES THAT COST MARKS

- Forgetting to square a difference, or squaring the sum $(x_2 - x_1 + y_2 - y_1)^2$.
- Swapping m_1 and m_2: m_1 multiplies the coordinates of the second point B.
- Taking $x = 0$ for a point on the x-axis. On the x-axis, $y = 0$.
- Dropping one value after a square root, or keeping one the question rules out.
- Leaving the ratio as $k = \frac{1}{2}$ instead of writing $1 : 2$, and not finding the point.
- Calling a figure a square from four equal sides only, without equal diagonals.

HOW TO USE THIS BOOKLET

1. **Day 1:** Notes, then Part A (NCERT) and Part B (Exemplar). Do every MUST DO question first.
2. **Day 2:** Part C (board pattern) and Part D (case studies).
3. **Day 3:** Part E (challenge) and the real board questions in Part F.
4. **Sun 27 Dec: Sunday chapter test – 20 marks in 40 minutes, without the booklet.**
5. Check every answer in the Answer Booklet. Write each mistake on the My Mistakes page.

RULES AT A GLANCE

Distance	$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
From origin	$\sqrt{x^2 + y^2}$
Section $m_1 : m_2$	$\left(\frac{m_1x_2 + m_2x_1}{m_1 + m_2}, \frac{m_1y_2 + m_2y_1}{m_1 + m_2}\right)$
Midpoint	$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$
Unknown ratio	take $k : 1$; x-axis $y = 0$, y-axis $x = 0$
Centroid	$\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3}\right)$
Parallelogram	diagonals have the same midpoint

PART A · NCERT PRACTICE

A NCERT Practice

The same skills as the NCERT examples and exercises, with new numbers. Finish every question before moving on.

Distance formula

A1. The distance of the point $(-6,\ 8)$ from the origin is: MUST DO [1]

(a) 14 (b) 2 (c) 10 (d) $2\sqrt{7}$

A2. Find the distance between the points: MUST DO [2]

(i) $(3,\ 4)$ and $(-5,\ -2)$ (ii) $(a,\ b)$ and $(-a,\ -b)$

A3. Check whether the points $A(1,\ 5)$, $B(2,\ 3)$ and $C(-2,\ 11)$ are collinear. [2]

A4. Show that $A(2,\ 1)$, $B(5,\ 3)$, $C(3,\ 6)$ and $D(0,\ 4)$ are the vertices of a square. MUST DO [3]

A5. Find the values of x for which the distance between $P(x,\ 3)$ and $Q(4,\ -1)$ is 5 units. MUST DO [2]

A6. Find the point on the y-axis which is equidistant from $A(5,\ -2)$ and $B(-3,\ 2)$. MUST DO [3]

A7. Find a relation between x and y such that the point $(x,\ y)$ is equidistant from $(1,\ 3)$ and $(5,\ 1)$. [2]

A8. Name the type of quadrilateral formed by $A(-2,\ 0)$, $B(2,\ 3)$, $C(6,\ 0)$ and $D(2,\ -3)$. Give reasons. [3]

A9. Show that $A(3,\ 0)$, $B(6,\ 4)$ and $C(-1,\ 3)$ are the vertices of a right-angled isosceles triangle. [3]

Section formula

A10. The midpoint of the segment joining $(-2,\ 7)$ and $(6,\ -3)$ is: [1]

(a) $(4,\ 4)$ (b) $(2,\ 2)$ (c) $(2,\ 5)$ (d) $(-4,\ 5)$

A11. Find the coordinates of the point which divides the join of $(-2,\ 3)$ and $(8,\ -7)$ in the ratio $3:2$. MUST DO [2]

A12. Find the points of trisection of the segment joining $A(-3,\ 4)$ and $B(6,\ -2)$. MUST DO [3]

A13. In what ratio does the point $P(2,\ 1)$ divide the join of $A(-4,\ 5)$ and $B(5,\ -1)$? [3]

A14. Find the ratio in which the y-axis divides the join of $(6,\ -2)$ and $(-3,\ 7)$. Also find the point of division. MUST DO [3]

A15. The points $A(2,\ 3)$, $B(5,\ 4)$, $C(x,\ 6)$ and $D(1,\ y)$, taken in order, are the vertices of a parallelogram. Find x and y. [2]

A16. $A(-1,\ 2)$ and $B(5,\ -6)$ are the ends of a diameter of a circle. Find its centre and radius. [2]

A17. Find the coordinates of the points which divide the join of $A(-4,\ 0)$ and $B(0,\ 8)$ into four equal parts. [3]

B

PART B · EXEMPLAR PRACTICE

Exemplar Practice

Exemplar-style questions on the same ideas, one step harder. Give a reason for every 2-mark answer.

Multiple choice

1 mark each

B1. The points $(-3,\ 0)$, $(3,\ 0)$ and $(0,\ 4)$ are the vertices of: [1]

(a) a right triangle (b) an equilateral triangle

(c) an isosceles triangle (d) a scalene triangle

B2. The point which divides the join of $(2,\ -5)$ and $(-4,\ 1)$ in the ratio $2:1$ lies in the: [1]

(a) first quadrant (b) second quadrant (c) third quadrant (d) fourth quadrant

B3. If the distance between $(4,\ p)$ and $(1,\ 0)$ is 5, then p is: [1]

(a) ± 4 (b) 4 only (c) -4 only (d) 0

B4. The point on the y-axis equidistant from $A(2,\ 3)$ and $B(6,\ 5)$ is: [1]

(a) $(0,\ 8)$ (b) $(0,\ 12)$ (c) $(0,\ 6)$ (d) $(12,\ 0)$

B5. If $P\left(\frac{a}{2},\ 3\right)$ is the midpoint of the segment joining $Q(-5,\ 2)$ and $R(1,\ 4)$, then a is: [1]

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

B6. Three vertices of parallelogram $ABCD$ are $A(-2,\ 1)$, $B(3,\ 2)$ and $C(5,\ 6)$. The fourth vertex D is: [1]

(a) $(0,\ 5)$ (b) $(6,\ 7)$ (c) $(-4,\ 5)$ (d) $(10,\ 7)$

B7. The x-axis divides the join of $(3,\ -4)$ and $(-5,\ 6)$ in the ratio: [1]

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

B8. ASSERTION–REASON [1]

Assertion (A): The point $(0,\ -4)$ lies on the y-axis.

Reason (R): Every point on the y-axis has abscissa 0.

Short answer with reasons

2–3 marks

B9. Is the point $P(2,\ -1)$ equidistant from $A(-1,\ 3)$ and $B(6,\ 2)$? Justify. [2]

B10. Find the point Q on the x-axis which lies on the perpendicular bisector of the segment joining $A(-3,\ 4)$ and $B(5,\ 4)$. What type of triangle is ABQ? [2]

B11. Find the length of the median through A of $\triangle ABC$ with $A(5,\ 1)$, $B(1,\ 5)$ and $C(-3,\ -1)$. [2]

B12. Find the point P on the segment AB, with $A(-3,\ 5)$ and $B(7,\ -5)$, such that $AP = \frac{2}{5}AB$. [3]

B13. For what value of p are the points $A(-1,\ 3)$, $B(2,\ p)$ and $C(5,\ -1)$ collinear? (Use the section formula.) [3]

Long answer

3–4 marks

B14. The segment joining $A(-5,\ 7)$ and $B(4,\ -2)$ is trisected at $P(p,\ 4)$ and $Q(1,\ q)$, with P nearer to A. Find p and q. [3]

B15. Show that $A(-2,\ -1)$, $B(4,\ 0)$, $C(3,\ 3)$ and $D(-3,\ 2)$ are the vertices of a parallelogram. Is it a rectangle? Justify. MUST DO [4]

B16. Find the centre and the radius of the circle passing through $A(-4,\ 2)$, $B(1,\ -3)$ and $C(5,\ 5)$. [4]

C

PART C · BOARD PATTERN

Board Pattern Practice

Question types from real 2024–2026 board papers and the 2026–27 Sample Paper, grouped by type. ★★★ = asked in 3 or 4 of the 4 papers checked · ★★ = 2 papers · ★ = 1 paper.

ASSERTION–REASON: HOW TO ANSWER

(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.

Distance formula: unknowns, circles, equidistant points

★★★ 4 of 4 papers · 1–2 marks

C1. The distance between $(0,\ 5)$ and $(-5,\ 0)$ is: MUST DO [1]

(a) 5 (b) $5\sqrt{2}$ (c) 10 (d) $2\sqrt{5}$

C2. The distance of the point $(4,\ -3)$ from the x-axis is: [1]

(a) 4 (b) 5 (c) 7 (d) 3

C3. If the distance between $(2,\ -3)$ and $(k,\ 5)$ is 10 units, then k is: [1]

(a) -8 or 4 (b) 8 only (c) 6 or -6 (d) 8 or -4

C4. Which point lies on the perpendicular bisector of the segment joining $(-2,\ -5)$ and $(2,\ 5)$? [1]

(a) $(2,\ 5)$ (b) $(5,\ 2)$ (c) $(5,\ -2)$ (d) $(-2,\ -5)$

C5. A circle has centre $(a+2,\ 2a-1)$ and radius 5 units. It passes through $(1,\ 2)$. Find the possible values of a. MUST DO [2]

C6. Find the point on the x-axis which is equidistant from $A(7,\ 6)$ and $B(-3,\ 4)$. MUST DO [2]

C7. Show that $A(-1,\ 0)$, $B(3,\ 0)$ and $C(1,\ 2\sqrt{3})$ are the vertices of an equilateral triangle. [2]

C8. $A(1,\ 3)$ is equidistant from $B(4,\ p)$ and $C(p,\ 6)$. Find p and the length AB. [2]

Section formula: ratio and point of division

★★★ 4 of 4 papers · 3 marks

C9. The point $P(-2,\ 3)$ divides the join of $A(-6,\ 5)$ and $B(6,\ -1)$ in the ratio: MUST DO [1]

(a) $2:1$ (b) $1:2$ (c) $1:3$ (d) $3:1$

C10. The x-axis divides the join of $(1,\ -2)$ and $(4,\ 6)$ in the ratio: [1]

(a) $1:3$ (b) $3:1$ (c) $2:3$ (d) $3:2$

C11. $P(1,\ 2)$ divides AB in the ratio $3:1$, where A is $(-2,\ 5)$. Then B is: [1]

(a) $(1,\ 2)$ (b) $(4,\ -1)$ (c) $(2,\ 1)$ (d) $(2,\ -1)$

C12. ASSERTION–REASON [1]

Assertion (A): The midpoint of the segment joining $(-3,\ 7)$ and $(3,\ -7)$ is the origin.

Reason (R): The midpoint of the join of $(x_1,\ y_1)$ and $(x_2,\ y_2)$ is $\left(\dfrac{x_1+x_2}{2},\ \dfrac{y_1+y_2}{2}\right)$.

C13. Find the ratio in which the y-axis divides the segment joining $(-4,\ 7)$ and $(8,\ -5)$. Also find the point of intersection. MUST DO [3]

C14. Find the ratio in which the x-axis divides the join of $A(4,\ -6)$ and $B(-1,\ 4)$. Also find the point of division. [3]

C15. The point $P(x,\ 4)$ lies on the segment joining $A(-5,\ 8)$ and $B(4,\ -10)$. Find the ratio in which P divides AB, and find x. MUST DO [3]

Midpoint: median, diameter, parallelogram

★★★ 4 of 4 papers · 1 mark

C16. The midpoint of the segment joining $(-3,\ 4)$ and $(3,\ 6)$ lies on: MUST DO [1]

(a) the x -axis (b) the y -axis (c) the origin (d) neither axis

C17. One end of a diameter of a circle with centre $(3,\ -1)$ is $(7,\ 2)$. The other end is: [1]

(a) $(11,\ 5)$ (b) $(5,\ 0.5)$ (c) $(4,\ 3)$ (d) $(-1,\ -4)$

C18. The length of the median through A of $\triangle ABC$ with $A(2,\ 5)$, $B(-1,\ 2)$ and $C(5,\ -2)$ is: [1]

(a) 3 (b) $\sqrt{29}$ (c) 5 (d) 25

C19. ASSERTION–REASON [1]

Assertion (A): If $A(1,\ 2)$, $B(4,\ 3)$ and $C(6,\ 6)$ are three vertices of parallelogram $ABCD$, then D is $(3,\ 5)$.

Reason (R): The diagonals of a parallelogram bisect each other.

C20. $ABCD$ is a parallelogram with $A(-1,\ 3)$, $B(4,\ 5)$ and $D(1,\ -2)$. Find the vertex C. MUST DO [2]

C21. $A(0,\ 0)$, $B(8,\ 0)$, $C(8,\ 6)$ and $D(0,\ 6)$ form a rectangle. P, Q, R, S are the midpoints of AB, BC, CD, DA. Show that $PQRS$ is a rhombus. [3]

D

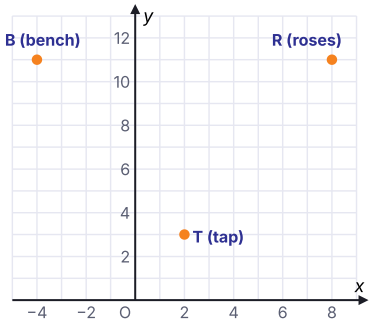
PART D · SECTION E STYLE

Case-Based Questions

Each case carries 4 marks (1 + 1 + 2), as in Section E of the board paper. Read the situation carefully before answering.

D1. Case Study · School Garden [4]

The school garden is drawn on a grid in which 1 unit = 1 m. The tap is at $T(2,\ 3)$, the rose bed at $R(8,\ 11)$ and the bench at $B(-4,\ 11)$.



(i) How far is the rose bed from the tap? [1]

(ii) A lamp is to be fixed midway between the rose bed and the bench. Where is it? [1]

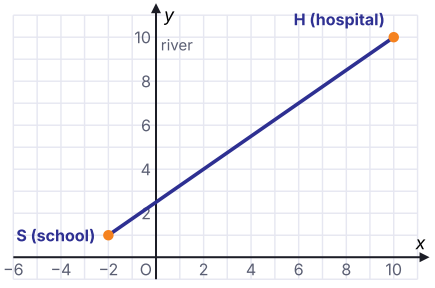
(iii) A sprinkler S is placed on TR so that $TS : SR = 1 : 3$. Find its position. [2]

OR

(iii) Show that T, R and B form an isosceles triangle. [2]

D2. Case Study · Town Map [4]

On a town map (1 unit = 1 km), the school is at $S(-2,\ 1)$ and the hospital at $H(10,\ 10)$. A straight road joins them. A river runs along the y-axis.



(i) Find the length of the road SH. [1]

(ii) A bus stop is built at the midpoint of SH. Find its position. [1]

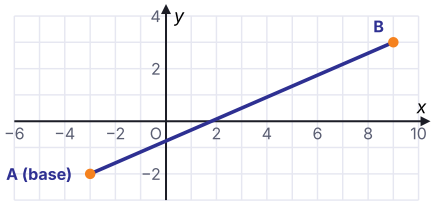
(iii) A metro station M on SH is twice as far from S as from H. Find M. [2]

OR

(iii) The road crosses the river at P. In what ratio does P divide SH? Find P. [2]

D3. Case Study · Drone Delivery [4]

A drone flies in a straight line from its base $A(-3,\ -2)$ to a village $B(9,\ 3)$. On the map, 1 unit = 100 m, and the x-axis is a highway.



(i) How far does the drone fly from A to B? [1]

(ii) It drops a parcel at the midpoint of AB. Where is the parcel dropped? [1]

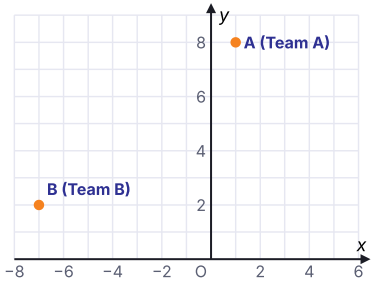
(iii) The drone crosses the highway at Q. Find the ratio $AQ : QB$ and the point Q. [2]

OR

(iii) Find the point on AB that is one quarter of the way from A to B. [2]

D4. Case Study · Treasure Hunt [4]

In a treasure hunt on a grid map, Team A stands at $A(1,\ 8)$ and Team B at $B(-7,\ 2)$. The treasure T is on the y-axis, equally far from both teams.



(i) How far apart are the two teams? [1]

(ii) The judges stand at the midpoint of AB. Where are they? [1]

(iii) Find the position of the treasure. [2]

OR

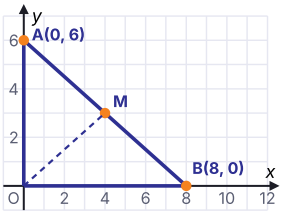
(iii) The treasure is at $T(0,\ 1)$. Show that $\triangle ATB$ is a right-angled isosceles triangle. [2]

PART E · FOR 95+

E Challenge Questions

Harder than the usual board question. Try these after Parts A–D: they stretch the same methods to the toughest 3- and 5-mark questions.

E1. $O(0,\ 0)$, $A(0,\ 6)$ and $B(8,\ 0)$ form a right triangle. Show that the midpoint M of the hypotenuse AB is equidistant from all three vertices. [3]



E2. Two vertices of $\triangle ABC$ are $A(-1,\ 4)$ and $B(5,\ 2)$, and its centroid is $G(0,\ -3)$. Find the third vertex C. [3]

E3. $\triangle ABC$ has $A(2,\ 7)$, $B(-4,\ 1)$, $C(5,\ -2)$. AD is a median. Find the point P on AD with $AP : PD = 2 : 1$, and show that P also divides the median BE in the ratio $2 : 1$. [3]

E4. The point $P(x,\ y)$ is equidistant from $A(a,\ b)$ and $B(b,\ a)$, where $a \neq b$. Prove that $x = y$. [3]

E5. $A(-3,\ 2)$, $B(a,\ -1)$, $C(5,\ b)$ and $D(2,\ 4)$ are the vertices of parallelogram $ABCD$. Find a and b, and the lengths of its sides. [3]

E6. P divides the join of $A(-2,\ 1)$ and $B(7,\ 4)$ in the ratio $k : 1$, and P lies on the line $x - y + 1 = 0$. Find k and the point P. [3]

F

PART F · REAL BOARD QUESTIONS

Board PYQ Index

Real questions from recent Maths Standard board papers and the 2026–27 Sample Paper, by type. Open the official paper and solve the listed questions.

Frequency	Question type	Marks	Where asked (year: paper code, question number)	Practise here
★★★	**Section formula: ratio in which an axis or a point divides a segment**	3	**2026:** 30/1/1 Q27 · **2025:** 30/1/1 Q28 · **2024:** 30/1/1 Q26(A) · **SQP 2026–27:** Q30	A10–A17, C9–C15, D2–D3
★★★	**Distance formula: unknown coordinate, circle, equidistant point**	1–2	**2026:** 30/1/1 Q23 · **2025:** 30/1/1 Q23 · **2024:** 30/1/1 Q11 · **SQP 2026–27:** Q7	A1–A9, C1–C8, D1, D4
★★★	**Midpoint: which axis, median length, end of a diameter, parallelogram**	1	**2026:** 30/1/1 Q8 · **2025:** 30/1/1 Q3 · **2024:** 30/1/1 Q6, Q17 · **SQP 2026–27:** Q14, Q19	A10, A15–A16, C16–C21
★☆☆	**Figure from coordinates (midpoints of a rectangle)**	3	**2024:** 30/1/1 Q26(B)	A4, A8–A9, B15, C7, C21

PAPERS CHECKED

- **2026:** 30/1/1 (Delhi, Set 1)
- **2025:** 30/1/1 (Delhi, Set 1)
- **2024:** 30/1/1 (Delhi, Set 1)
- **CBSE Sample Paper 2026–27** (Mathematics Standard)

Sets of one code family (30/1/1, 30/1/2, 30/1/3) share most questions, so each counts as one paper. Download the official papers from cbse.gov.in → Previous Year Question Papers, and solve the exact questions listed above.

PART G · YOUR RECORD

G My Mistakes

Write down each mistake from this chapter, including the chapter test.

Every wrong answer is a free lesson. Write it here, find the rule you missed, and redo the question after three days. Bring this page to class before the next test.

Date	Part & Q No.	What went wrong	Correct rule or method	Redone ✓