Class 10 Maths Chapter 7: Coordinate Geometry - Notes, Important Questions and MCQs (2026-27)

Free PDF notes from Nextoper.in | Session 2026-27 | Read online:
https://nextoper.in/class-10-maths-chapter-7-pdf-notes/

These Coordinate Geometry Class 10 notes cover NCERT Class 10 Maths Chapter 7 for 2026-27: the distance formula, the section formula, the midpoint formula, points of trisection and how to test collinearity or identify shapes – with solved examples, 10 MCQs and a free PDF.

Use the table of contents below to jump to the part you need, or read top to bottom for a complete revision of the chapter.

Table of Contents

- Chapter Overview
- Important Topics and Concepts
- Solved Examples
- Which Formula to Use
- Key Formulas at a Glance
- Important Formulas and Definitions
- Short Answer Questions
- Long Answer Questions
- MCQs with Answers
- Quick Revision Points
- Chapter Summary
- Exam Tips and PYQ Pattern
- Frequently Asked Questions
- Conclusion

Want notes for every chapter? Explore the full Class 10 Maths notes on Nextoper, arranged book-wise and chapter-wise.

Chapter Overview

Coordinate geometry describes points by ordered pairs (x, y) on the Cartesian plane. The x-coordinate (abscissa) is the distance from the y-axis and the y-coordinate (ordinate) is the distance from the x-axis.

This chapter gives two formulas: the distance between two points and the coordinates of a point dividing a segment in a given ratio. With them you can check whether points are collinear, find missing vertices and classify triangles and quadrilaterals. (Area of a triangle is not in the 2026-27 syllabus.)

Important Topics and Concepts

Distance Formula

- Distance between $P(x_1, y_1)$ and $Q(x_2, y_2)$: $PQ = \sqrt{[(x_2 - x_1)^2 + (y_2 - y_1)^2]}$.
- Distance of $P(x, y)$ from the origin = $\sqrt{(x^2 + y^2)}$.
- Example: distance between (2, 3) and (4, 1) = $\sqrt{(4 + 4)} = 2\sqrt{2}$.

Section Formula

- Point dividing the join of $A(x_1, y_1)$ and $B(x_2, y_2)$ internally in ratio $m_1 : m_2$: $P = ((m_1x_2 + m_2x_1)/(m_1 + m_2), (m_1y_2 + m_2y_1)/(m_1 + m_2))$.
- If the ratio is unknown, take it as $k : 1$ and solve for k.
- Example: point dividing (4, −3) and (8, 5) in 3 : 1 is $((24 + 4)/4, (15 - 3)/4) = (7, 3)$.

Midpoint and Trisection

- Midpoint of AB = $((x_1 + x_2)/2, (y_1 + y_2)/2)$.
- Points of trisection divide AB in ratios 1 : 2 and 2 : 1.
- Diagonals of a parallelogram bisect each other – equate midpoints to find a missing vertex.

Using Distances to Identify Figures

- Collinear points: the sum of two distances equals the third.
- Equilateral triangle: all three sides equal; isosceles: two sides equal; right triangle: Pythagoras holds.
- Square: four equal sides and equal diagonals; rhombus: four equal sides, unequal diagonals; rectangle: opposite sides equal and diagonals equal; parallelogram: opposite sides equal.

Solved Examples

Board-pattern questions with full working.

- Find the point on the x-axis equidistant from (2, −5) and (−2, 9). Let it be (x, 0): $(x - 2)^2 + 25 = (x + 2)^2 + 81 \rightarrow -8x = 56 \rightarrow x = -7$. Point (−7, 0).
- Find the points of trisection of the segment joining (2, −2) and (−7, 4). 1 : 2 → $((-7 + 4)/3, (4 - 4)/3) = (-1, 0)$; 2 : 1 → $((-14 + 2)/3, (8 - 2)/3) = (-4, 2)$.
- In what ratio does the y-axis divide the join of (5, −6) and (−1, −4)? Find the point. Ratio k : 1 with $x = (-k + 5)/(k + 1) = 0 \rightarrow k = 5$. Ratio 5 : 1; point $(0, (-20 - 6)/6) = (0, -13/3)$.
- Check whether (1, −1), (5, 2), (9, 5) are collinear. AB = 5, BC = 5, AC = 10 = AB + BC, so they are collinear.

Which Formula to Use

Quick decision guide.

Question asks for…	Use
length, perimeter, equidistant point	Distance formula
point dividing a segment in m : n	Section formula
centre of a circle from diameter ends	Midpoint formula

Question asks for...	Use
ratio in which a point/axis divides	Section formula with k : 1
missing vertex of a parallelogram	Diagonals bisect – equal midpoints

Key Formulas at a Glance

Name	Formula
Distance	$\sqrt{[(x_2 - x_1)^2 + (y_2 - y_1)^2]}$
Distance from origin	$\sqrt{(x^2 + y^2)}$
Section $(m_1 : m_2)$	$((m_1x_2 + m_2x_1)/(m_1 + m_2), (m_1y_2 + m_2y_1)/(m_1 + m_2))$
Midpoint	$((x_1 + x_2)/2, (y_1 + y_2)/2)$
Unknown ratio	take k : 1

Important Formulas and Definitions

Formula / Term	Meaning / Use
Abscissa	x-coordinate of a point
Ordinate	y-coordinate of a point
Origin	(0, 0), where the axes meet
Collinear points	Points lying on the same straight line
Midpoint	Point dividing a segment in ratio 1 : 1
Points of trisection	Two points dividing a segment into three equal parts

Short Answer Questions

Q1. Find the distance between (−5, 7) and (−1, 3).

$\sqrt{[(4)^2 + (-4)^2]} = \sqrt{32} = 4\sqrt{2}$.

Q2. Find the distance of (−6, 8) from the origin.

$\sqrt{(36 + 64)} = 10$.

Q3. Find the midpoint of the join of (−1, 7) and (4, −3).

$((-1 + 4)/2, (7 - 3)/2) = (3/2, 2)$.

Q4. If (1, 2), (4, y), (x, 6), (3, 5) are vertices of a parallelogram in order, find x and y.

Midpoints of diagonals are equal: $(1 + x)/2 = 7/2 \rightarrow x = 6$; $(2 + 6)/2 = (y + 5)/2 \rightarrow y = 3$.

Q5. Find the coordinates of the point dividing the join of (−1, 7) and (4, −3) in the ratio 2 : 3.

$((8 - 3)/5, (-6 + 21)/5) = (1, 3)$.

Q6. Find x if the distance between (x, 3) and (5, 7) is 5.

$(x - 5)^2 + 16 = 25 \rightarrow x - 5 = \pm 3 \rightarrow x = 8$ or 2.

Q7. Find the centre of a circle whose diameter has ends (2, −3) and (−2, 7).

Q8. Find the ratio in which (−4, 6) divides the join of (−6, 10) and (3, −8).

(3k − 6)/(k + 1) = −4 → 7k = 2 → k = 2/7. Ratio 2 : 7.

Long Answer Questions

Q1. Show that (1, 7), (4, 2), (−1, −1) and (−4, 4) are the vertices of a square.

AB = √(9 + 25) = √34; BC = √(25 + 9) = √34.

CD = √(9 + 25) = √34; DA = √(25 + 9) = √34.

Diagonal AC = √(4 + 64) = √68; diagonal BD = √(64 + 4) = √68.

All four sides are equal and the diagonals are equal.

Hence ABCD is a square.

Q2. Find the coordinates of the points which divide the join of A(−2, 2) and B(2, 8) into four equal parts.

The midpoint Q of AB = (0, 5).

P is the midpoint of AQ = (−1, 7/2).

R is the midpoint of QB = (1, 13/2).

So the points are (−1, 7/2), (0, 5) and (1, 13/2).

Check: they divide AB in ratios 1 : 3, 1 : 1 and 3 : 1.

Q3. If A(−2, −1), B(a, 0), C(4, b) and D(1, 2) are the vertices of a parallelogram in order, find a and b. Also find AB.

Diagonals AC and BD bisect each other.

Midpoint of AC = (1, (b − 1)/2); midpoint of BD = ((a + 1)/2, 1).

(a + 1)/2 = 1 → a = 1; (b − 1)/2 = 1 → b = 3.

So B(1, 0) and C(4, 3).

AB = √(9 + 1) = √10 units.

MCQs with Answers

1. The distance of (3, 4) from the origin is(a) 3 (b) 4 (c) 5 (d) 7Answer: (c) 5

2. The midpoint of (2, 3) and (4, 7) is(a) (3, 5) (b) (6, 10) (c) (1, 2) (d) (3, 4)Answer: (a) (3, 5)

3. The point (0, −5) lies on(a) x-axis (b) y-axis (c) origin (d) first quadrantAnswer: (b) y-axis

4. Distance between (a, 0) and (0, a) is(a) a (b) 2a (c) a√2 (d) √aAnswer: (c) a√2

5. The ratio in which the x-axis divides the join of (2, −3) and (5, 6) is(a) 1 : 2 (b) 2 : 1 (c) 3 : 2 (d) 1 : 1Answer: (a) 1 : 2 – y = (6k − 3)/(k + 1) = 0 → k = 1/2

6. If the midpoint of (x, 4) and (2, 8) is (3, 6), x =(a) 2 (b) 4 (c) 6 (d) 8Answer: (b) 4

7. Points A, B, C are collinear if(a) AB = BC (b) AB + BC = AC (for suitable order) (c) AB = AC (d) AB × BC = ACAnswer: (b) AB + BC = AC (for suitable order)

9. Point dividing (1, 2) and (4, 8) in 1 : 2 is(a) (2, 4) (b) (3, 6) (c) (2.5, 5) (d) (1, 4)Answer: (a) (2, 4)

10. Which topic is NOT in the 2026-27 syllabus of this chapter?(a) Distance formula (b) Section formula (c) Area of a triangle (d) Midpoint formulaAnswer: (c) Area of a triangle

Quick Revision Points

- Distance = $\sqrt{[(x_2 - x_1)^2 + (y_2 - y_1)^2]}$.
- Section formula ($m_1 : m_2$) – weight the far end with the near ratio.
- Midpoint = average of coordinates.
- Unknown ratio → k : 1; axis → put x = 0 or y = 0.
- Parallelogram: equal midpoints of diagonals.
- Collinear: sum of two distances = third.

Chapter Summary

Coordinate Geometry uses the distance formula to measure lengths between points and the section formula to locate a point dividing a segment in a given ratio; the midpoint formula is the special 1 : 1 case.

These tools let you find equidistant points, trisection points, unknown ratios and missing vertices, and decide whether points are collinear or form a square, rhombus, rectangle or a particular triangle.

Exam Tips and PYQ Pattern

- Section-formula and distance-formula questions appear every year (2–3 marks).
- Write the formula first, then substitute – it earns step marks.
- For shape questions, compute all sides and both diagonals.
- Simplify surds fully ($\sqrt{32} = 4\sqrt{2}$).
- Area of a triangle by coordinates is not required in 2026-27.

Frequently Asked Questions

Is this chapter in the 2026-27 CBSE syllabus?

Yes. It is part of the NCERT Class 10 Mathematics textbook and the rationalised CBSE syllabus for 2026-27.

Can I download these notes as a PDF?

Yes. Use the free PDF link at the top of this page – no signup needed.

What is the section formula?

The point dividing (x_1, y_1) and (x_2, y_2) in $m_1 : m_2$ is $((m_1x_2 + m_2x_1)/(m_1 + m_2), (m_1y_2 + m_2y_1)/(m_1 + m_2))$.

How do I prove points are collinear without area?

Show that the sum of two distances equals the third distance.

Conclusion

With just two formulas, Coordinate Geometry is one of the most scoring Class 10 chapters. Revise the formula table and solved examples here, and save the free PDF for practice.

More Notes: Class 10 Maths Chapter 6: Triangles notes | Class 10 Maths Chapter 8: Introduction to Trigonometry notes | All Class 10 Maths notes

Author Bio: Written and reviewed by the Nextoper Editorial Team, a group of CBSE mathematics educators who build chapter notes directly from the NCERT textbook and past board paper patterns.

Freshness Note: These notes follow the NCERT Class 10 Maths textbook, Mathematics (Reprint 2026-27), and the CBSE syllabus for the 2026-27 session. Last checked on 16 November 2026.