

# NCERT Solutions for Class 10 Maths Chapter 7 Ex 7.4 | Updated 2026-27

## ✂ Quick Revision Box — Coordinate Geometry Ex 7.4

- **Area of Triangle Formula:**  $\text{Area} = \frac{1}{2} |x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$
- **Collinearity Condition:** Three points are collinear if the area of the triangle formed = 0
- **Section Formula (Internal):**  $P = \left(\frac{m x_2 + n x_1}{m+n}, \frac{m y_2 + n y_1}{m+n}\right)$
- **Mid-Point Formula:**  $M = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$
- **Centroid Formula:**  $G = \left(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3}\right)$
- **Centroid divides each median** in the ratio 2:1 from the vertex
- **Distance Formula:**  $d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$
- **Chapter Weightage:** Coordinate Geometry carries 6 marks in CBSE Class 10 board exams

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The **NCERT Solutions for Class 10 Maths Chapter 7 Ex 7.4** on this page cover all 8 questions from the Coordinate Geometry exercise, fully updated for the **2026-27** CBSE board exam. You will find complete step-by-step solutions using the area of triangle formula, section formula, collinearity condition, and centroid — all essential topics for scoring well. These solutions are part of our comprehensive [NCERT Solutions for Class 10](#) and are prepared by experienced CBSE teachers. You can also explore all chapters in our [NCERT Solutions](#) library.

## NCERT Solutions for Class 10 Maths Chapter 7 Ex 7.4 — Chapter Overview

Chapter 7 of the NCERT Class 10 Maths textbook is **Coordinate Geometry**. Exercise 7.4 is the final and most application-heavy exercise of this chapter. It tests your ability to apply the area of triangle formula, section formula, collinearity condition, and the concept of centroid in real-world and abstract problems. You can download the official textbook from the [NCERT official website](#).

For CBSE board exams, Coordinate Geometry carries **6 marks** in the standard question paper. Questions from Exercise 7.4 typically appear as 2–3 mark problems or as part of case-study questions. The chapter builds on your knowledge of the distance formula (Ex 7.1) and section formula (Ex 7.2 and 7.3), so make sure those concepts are clear before attempting Ex 7.4.

Detail	Information
Chapter	Chapter 7 — Coordinate Geometry
Textbook	NCERT Mathematics (Class 10)
Exercise	Exercise 7.4
Number of Questions	8
Subject	Mathematics
Marks Weightage	6 marks (full chapter)
Difficulty Level	Medium to Hard
Academic Year	2026-27

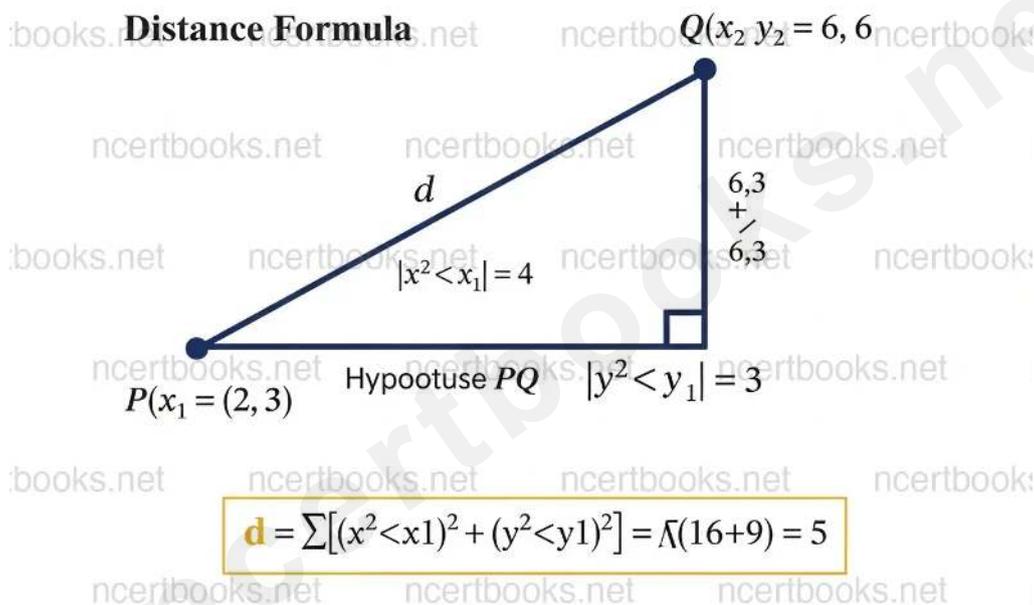


Fig 7.1: Distance formula —  $d = \sqrt{[(x_2 - x_1)^2 + (y_2 - y_1)^2]}$

## Key Concepts and Formulas — Coordinate Geometry Exercise 7.4

### Area of a Triangle Using Coordinates

If  $A(x_1, y_1)$ ,  $B(x_2, y_2)$  and  $C(x_3, y_3)$  are the vertices of a triangle, then:

$$\text{Area of } \triangle ABC = \frac{1}{2} |x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$$

The modulus (absolute value) ensures the area is always positive. If the result is 0, the three points are collinear (they lie on the same line).

### Section Formula — Internal Division

If point P divides the segment joining  $A(x_1, y_1)$  and  $B(x_2, y_2)$  in the ratio  $m:n$  internally, then:

$$P = \left( \frac{mx_2 + nx_1}{m+n}, \frac{my_2 + ny_1}{m+n} \right)$$

### Centroid of a Triangle

The centroid is the point where all three medians of a triangle intersect. For a triangle with vertices  $A(x_1, y_1)$ ,  $B(x_2, y_2)$ ,  $C(x_3, y_3)$ :

$$G = \left( \frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3} \right)$$

The centroid divides each median in the ratio **2:1** from the vertex side.

### Collinearity of Three Points

Three points  $P(x_1, y_1)$ ,  $Q(x_2, y_2)$ ,  $R(x_3, y_3)$  are collinear if and only if:

$$x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2) = 0$$

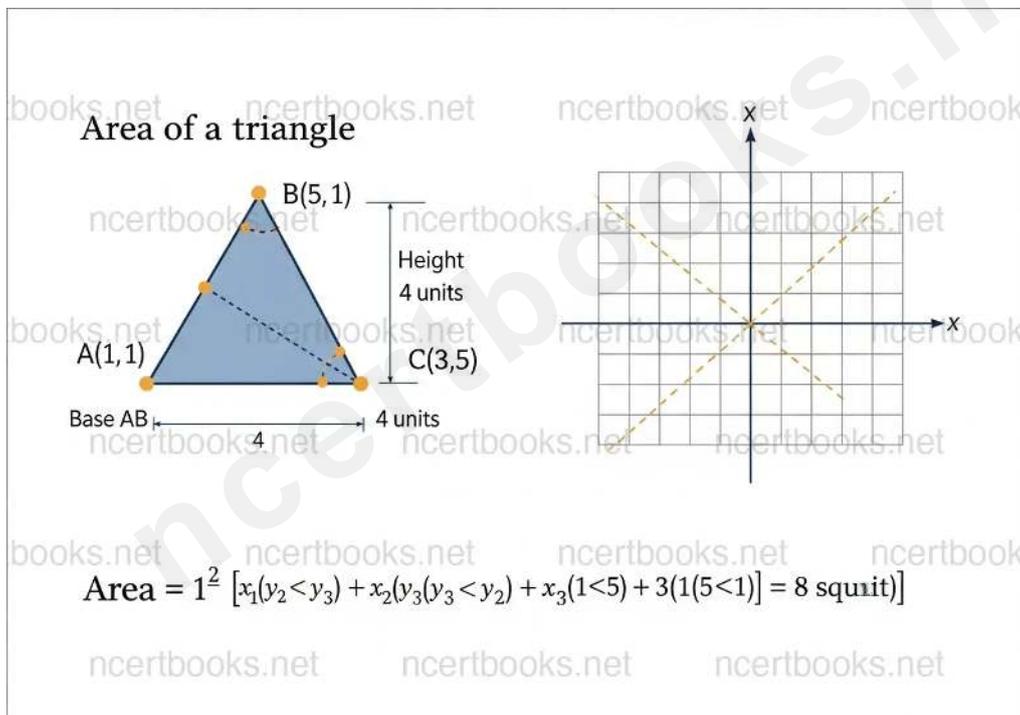


Fig 7.3: Area of triangle from vertices using coordinate formula

## NCERT Solutions Class 10 Maths Chapter 7 Ex 7.4 — All 8 Questions Solved Step by Step

### Question 1

Medium

Determine the ratio in which the line  $2x + y - 4 = 0$  divides the line segment joining the points  $A(2, -2)$  and  $B(3, 7)$ .

**Key Concept:** Use the section formula. Let the line divide AB in ratio  $k:1$ . Then find the coordinates of the dividing point and substitute into the line equation.

**Step 1:** Let the line  $2x + y - 4 = 0$  divide AB in ratio  $k:1$  at point P.

**Step 2:** By section formula, coordinates of P are:

$$P = \left( \frac{3k + 2}{k + 1}, \frac{7k - 2}{k + 1} \right)$$

**Step 3:** Since P lies on  $2x + y - 4 = 0$ , substitute:

$$2 \cdot \frac{3k + 2}{k + 1} + \frac{7k - 2}{k + 1} - 4 = 0$$

**Step 4:** Multiply throughout by  $(k + 1)$ :

$$2(3k + 2) + (7k - 2) - 4(k + 1) = 0$$

$$6k + 4 + 7k - 2 - 4k - 4 = 0$$

$$9k - 2 = 0$$

$$k = \frac{2}{9}$$

**Step 5:** The ratio is  $k:1 = \frac{2}{9}:1 = 2:9$ .

*Why does this work?* Since  $k$  is positive, the division is internal.

**∴ The line  $2x + y - 4 = 0$  divides AB in the ratio 2:9 internally.**

**Board Exam Note:** This type of question typically appears in 2-3 mark sections of CBSE board papers. Showing step-by-step working is mandatory.

## Question 2

Easy

Find a relation between  $x$  and  $y$ , if the points  $(x, y)$ ,  $(1, 2)$  and  $(7, 0)$  are collinear.

**Key Concept:** Three points are collinear when the area of the triangle formed by them equals zero.

**Step 1:** Let  $A(x, y)$ ,  $B(1, 2)$ ,  $C(7, 0)$ . Apply the collinearity condition:

$$x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2) = 0$$

**Step 2:** Substitute the values:

$$x(2 - 0) + 1(0 - y) + 7(y - 2) = 0$$

**Step 3:** Expand and simplify:

$$2x - y + 7y - 14 = 0$$

$$2x + 6y - 14 = 0$$

$$x + 3y - 7 = 0$$

∴ The required relation is  $x + 3y - 7 = 0$ .

**Board Exam Note:** This type of question typically appears in 2-3 mark sections of CBSE board papers. Showing step-by-step working is mandatory.

### Question 3

Medium

Find the centre of a circle passing through the points (6, -6), (3, -7) and (3, 3).

**Key Concept:** The centre of a circle is equidistant from all points on the circle. Set up two distance equations and solve simultaneously.

**Step 1:** Let the centre be O(x, y). Then OA = OB = OC.

**Step 2:** Using  $OA^2 = OB^2$  with A(6,-6) and B(3,-7):

$$(x-6)^2 + (y+6)^2 = (x-3)^2 + (y+7)^2$$

$$x^2 - 12x + 36 + y^2 + 12y + 36 = x^2 - 6x + 9 + y^2 + 14y + 49$$

$$-12x + 12y + 72 = -6x + 14y + 58$$

$$-6x - 2y + 14 = 0$$

$$3x + y = 7 \cdots (1)$$

**Step 3:** Using  $OB^2 = OC^2$  with B(3,-7) and C(3,3):

$$(x-3)^2 + (y+7)^2 = (x-3)^2 + (y-3)^2$$

$$(y+7)^2 = (y-3)^2$$

$$y^2 + 14y + 49 = y^2 - 6y + 9$$

$$20y = -40$$

$$y = -2$$

**Step 4:** Substitute  $y = -2$  into equation (1):

$$3x + (-2) = 7 \Rightarrow 3x = 9 \Rightarrow x = 3$$

∴ The centre of the circle is (3, -2).

**Board Exam Note:** This type of question typically appears in 2-3 mark sections of CBSE board papers. Showing step-by-step working is mandatory.

#### Question 4

Hard

The two opposite vertices of a square are  $(-1, 2)$  and  $(3, 2)$ . Find the coordinates of the other two vertices.

**Key Concept:** In a square, diagonals are equal, bisect each other at right angles, and all sides are equal. Use the midpoint of the diagonal and properties of a square to find the unknown vertices.

**Step 1:** Let  $A(-1, 2)$  and  $C(3, 2)$  be opposite vertices. The midpoint of diagonal  $AC$  is:

$$M = \left(\frac{-1+3}{2}, \frac{2+2}{2}\right) = (1, 2)$$

**Step 2:** Let the other two vertices be  $B(x, y)$  and  $D(x', y')$ . Since  $ABCD$  is a square,  $AB = BC$  and  $\angle ABC = 90^\circ$ .

**Step 3:** Since  $AB = BC$ :

$$(x+1)^2 + (y-2)^2 = (x-3)^2 + (y-2)^2$$

$$(x+1)^2 = (x-3)^2$$

$$x^2 + 2x + 1 = x^2 - 6x + 9$$

$$8x = 8 \Rightarrow x = 1$$

**Step 4:** Since  $AB^2 + BC^2 = AC^2$  (right angle at  $B$ ):

$$AC^2 = (3-(-1))^2 + (2-2)^2 = 16$$

$$AB^2 = (1+1)^2 + (y-2)^2 = 4 + (y-2)^2$$

$$BC^2 = (1-3)^2 + (y-2)^2 = 4 + (y-2)^2$$

$$AB^2 + BC^2 = AC^2 \Rightarrow 8 + 2(y-2)^2 = 16$$

$$(y-2)^2 = 4 \Rightarrow y - 2 = \pm 2$$

$$y = 4 \text{ or } y = 0$$

**∴ The other two vertices of the square are  $B(1, 4)$  and  $D(1, 0)$ .**

**Board Exam Note:** This type of question typically appears in long answer sections of CBSE board papers. Showing step-by-step working is mandatory.

## Question 5

Hard

The class X students of a school in Krishnagar have been allotted a rectangular plot of land for their gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1 m from each other. There is a triangular grassy lawn in the plot as shown in the figure. The students are to sow seeds of flowering plants on the remaining area of the plot.

- (i) Taking A as origin, find the coordinates of the vertices of the triangle.  
(ii) What will be the coordinates of the vertices of  $\triangle PQR$ , if C is the origin? Also, calculate the areas of the triangles in these cases. What do you observe?

### (i) Taking A as origin

**Step 1:** The rectangular plot has dimensions 12 m  $\times$  10 m (as given in the NCERT figure). Taking A as origin, the x-axis runs along AB and the y-axis runs along AD.

**Step 2:** From the NCERT figure, the triangular lawn has vertices at:

- P = (4, 6)
- Q = (3, 2)
- R = (6, 5)

**Step 3:** Calculate area of  $\triangle PQR$  with A as origin:

$$\begin{aligned}\text{Area} &= \frac{1}{2} |4(2-5) + 3(5-6) + 6(6-2)| \\ &= \frac{1}{2} |4(-3) + 3(-1) + 6(4)| \\ &= \frac{1}{2} |-12 - 3 + 24| \\ &= \frac{1}{2} |9| = 4.5 \text{ sq. m}\end{aligned}$$

**Coordinates with A as origin: P(4, 6), Q(3, 2), R(6, 5). Area = 4.5 sq. m**

### (ii) Taking C as origin

**Step 1:** When C is the origin, the axes are reversed. C is at the corner diagonally opposite to A. The plot is 12 m  $\times$  10 m, so C is at (12, 10) from A.

**Step 2:** New coordinates = (12 - old x, 10 - old y):

- P' = (12-4, 10-6) = (8, 4)
- Q' = (12-3, 10-2) = (9, 8)
- R' = (12-6, 10-5) = (6, 5)

**Step 3:** Calculate area with C as origin:

$$\begin{aligned} \text{Area} &= \frac{1}{2} |8(8-5) + 9(5-4) + 6(4-8)| \\ &= \frac{1}{2} |24 + 9 - 24| \\ &= \frac{1}{2} |9| = 4.5 \text{ sq. m} \end{aligned}$$

**Coordinates with C as origin: P'(8, 4), Q'(9, 8), R'(6, 5). Area = 4.5 sq. m**

*Observation: The area of the triangle is the same (4.5 sq. m) regardless of which corner is taken as the origin. The area of a figure is independent of the choice of coordinate axes.*

**Board Exam Note:** This type of question typically appears in long answer sections of CBSE board papers. Showing step-by-step working is mandatory.

### Question 6

Hard

The vertices of  $\triangle ABC$  are A(4, 6), B(1, 5) and C(7, 2). A line is drawn to intersect sides AB and AC at D and E respectively, such that  $AD/AB = AE/AC = 1/4$ . Calculate the area of  $\triangle ADE$  and compare it with the area of  $\triangle ABC$ .

**Step 1:** Since  $AD/AB = 1/4$ , point D divides AB in ratio  $AD:DB = 1:3$ .

Coordinates of D:

$$D = \left( \frac{1 \cdot 1 + 3 \cdot 4}{1+3}, \frac{1 \cdot 5 + 3 \cdot 6}{1+3} \right) = \left( \frac{13}{4}, \frac{23}{4} \right)$$

**Step 2:** Since  $AE/AC = 1/4$ , point E divides AC in ratio  $AE:EC = 1:3$ .

Coordinates of E:

$$E = \left( \frac{1 \cdot 7 + 3 \cdot 4}{1+3}, \frac{1 \cdot 2 + 3 \cdot 6}{1+3} \right) = \left( \frac{19}{4}, \frac{20}{4} \right) = \left( \frac{19}{4}, 5 \right)$$

**Step 3:** Area of  $\triangle ADE$  with A(4,6), D(13/4, 23/4), E(19/4, 5):

$$\begin{aligned} \text{Area}_{ADE} &= \frac{1}{2} |4(23/4 - 5) + 13/4(5 - 6) + 19/4(6 - 23/4)| \\ &= \frac{1}{2} |4 \cdot 3/4 + 13/4(-1) + 19/4 \cdot 1/4| \\ &= \frac{1}{2} |3 - 13/4 + 19/16| \\ &= \frac{1}{2} |(48 - 52 + 19)/(16)| = \frac{1}{2} \cdot \frac{15}{16} = \frac{15}{32} \text{ sq. units} \end{aligned}$$

**Step 4:** Area of  $\triangle ABC$  with A(4,6), B(1,5), C(7,2):

$$\begin{aligned} \text{Area}_{ABC} &= \frac{1}{2} |4(5-2) + 1(2-6) + 7(6-5)| \\ &= \frac{1}{2} |12 - 4 + 7| = \frac{1}{2} \times 15 = \frac{15}{2} \text{ sq. units} \end{aligned}$$

**Step 5:** Ratio:

$$\frac{\text{Area}_{\triangle ADE}}{\text{Area}_{\triangle ABC}} = (15/32)/(15/2) = 15/32 \times 2/15 = 1/16$$

∴ Area of  $\triangle ADE = 15/32$  sq. units. Area of  $\triangle ABC = 15/2$  sq. units. The ratio (Area of  $\triangle ADE$ )/(Area of  $\triangle ABC$ ) =  $1/16$ .

**Board Exam Note:** This type of question typically appears in long answer sections of CBSE board papers. Showing step-by-step working is mandatory.

### Question 7

Hard

Let  $A(4, 2)$ ,  $B(6, 5)$  and  $C(1, 4)$  be the vertices of  $\triangle ABC$ .

- (i) The median from  $A$  meets  $BC$  at  $D$ . Find the coordinates of point  $D$ .
- (ii) Find the coordinates of point  $P$  on  $AD$  such that  $AP:PD = 2:1$ .
- (iii) Find the coordinates of points  $Q$  and  $R$  on medians  $BE$  and  $CF$  respectively, such that  $BQ:QE = 2:1$  and  $CR:RF = 2:1$ .
- (iv) What do you observe?
- (v) If  $A(x_1, y_1)$ ,  $B(x_2, y_2)$  and  $C(x_3, y_3)$  are the vertices of  $\triangle ABC$ , find the coordinates of the centroid.

#### (i) Coordinates of $D$ (midpoint of $BC$ )

$D$  is the midpoint of  $BC$  where  $B(6,5)$  and  $C(1,4)$ :

$$D = (6+1/2, 5+4/2) = (7/2, 9/2)$$

$$D = (7/2, 9/2)$$

#### (ii) Coordinates of $P$ on $AD$ with $AP:PD = 2:1$

$P$  divides  $AD$  in ratio  $2:1$  with  $A(4,2)$  and  $D(7/2, 9/2)$ :

$$P = ((2 \cdot 7/2 + 1 \cdot 4)/(3), (2 \cdot 9/2 + 1 \cdot 2)/(3)) = (7+4/3, 9+2/3) = (11/3, 11/3)$$

$$P = (11/3, 11/3)$$

#### (iii) Coordinates of $Q$ on median $BE$ and $R$ on median $CF$

**For  $Q$ :**  $E$  is the midpoint of  $AC$  where  $A(4,2)$  and  $C(1,4)$ :

$$E = (4+1/2, 2+4/2) = (5/2, 3)$$

$Q$  divides  $BE$  in ratio  $2:1$  with  $B(6,5)$  and  $E(5/2, 3)$ :

$$Q = ((2 \cdot 5/2 + 1 \cdot 6)/(3), (2 \cdot 3 + 1 \cdot 5)/(3)) = (5+6/3, 6+5/3) = (11/3, 11/3)$$

**For  $R$ :**  $F$  is the midpoint of  $AB$  where  $A(4,2)$  and  $B(6,5)$ :

$$F = (4 + \frac{6}{2}, \frac{2 + 5}{2}) = (5, \frac{7}{2})$$

R divides CF in ratio 2:1 with C(1,4) and F(5, 7/2):

$$R = ((2 \cdot 5 + 1 \cdot 1)/3, (2 \cdot \frac{7}{2} + 1 \cdot 4)/3) = (\frac{11}{3}, \frac{7+4}{3}) = (\frac{11}{3}, \frac{11}{3})$$

$$Q = R = P = (\frac{11}{3}, \frac{11}{3})$$

#### (iv) Observation

**All three points P, Q, and R are the same: (11/3, 11/3). This means all three medians of a triangle meet at a single point called the centroid, which divides each median in the ratio 2:1 from the vertex.**

#### (v) General Centroid Formula

For a triangle with vertices A(x<sub>1</sub>, y<sub>1</sub>), B(x<sub>2</sub>, y<sub>2</sub>), C(x<sub>3</sub>, y<sub>3</sub>), the centroid G is the point dividing each median in ratio 2:1. Using the section formula on median from A to midpoint of BC:

$$G = ((x_1 + x_2 + x_3)/3, (y_1 + y_2 + y_3)/3)$$

$$\text{Centroid } G = ((x_1 + x_2 + x_3)/3, (y_1 + y_2 + y_3)/3)$$

**Board Exam Note:** This type of question typically appears in long answer sections of CBSE board papers. Showing step-by-step working is mandatory.

### Question 8

Hard

ABCD is a rectangle formed by the points A(-1, -1), B(-1, 4), C(5, 4) and D(5, -1). P, Q, R and S are the midpoints of AB, BC, CD and DA respectively. Is the quadrilateral PQRS a square? a rectangle? or a rhombus? Justify your answer.

**Step 1:** Find midpoints of each side using the midpoint formula.

$$P = \text{midpoint of AB: } P = ((-1 + (-1))/2, (-1 + 4)/2) = (-1, \frac{3}{2})$$

$$Q = \text{midpoint of BC: } Q = ((-1 + 5)/2, 4 + 4/2) = (2, 4)$$

$$R = \text{midpoint of CD: } R = (5 + 5/2, (4 + (-1))/2) = (5, \frac{3}{2})$$

$$S = \text{midpoint of DA: } S = ((5 + (-1))/2, (-1 + (-1))/2) = (2, -1)$$

**Step 2:** Find all side lengths of PQRS.

$$PQ = \sqrt{((2 - (-1)))^2 + (4 - \frac{3}{2})^2} = \sqrt{9 + \frac{25}{4}} = \sqrt{\frac{61}{4}} = \frac{\sqrt{61}}{2}$$

$$QR = \sqrt{((5 - 2))^2 + (\frac{3}{2} - 4)^2} = \sqrt{9 + \frac{25}{4}} = \frac{\sqrt{61}}{2}$$

$$RS = \sqrt{((2-5)^2 + (-1 - \frac{3}{2})^2)} = \sqrt{(9 + \frac{25}{4})} = \frac{\sqrt{61}}{2}$$

$$SP = \sqrt{((-1-2)^2 + (\frac{3}{2}-(-1))^2)} = \sqrt{(9 + \frac{25}{4})} = \frac{\sqrt{61}}{2}$$

All four sides are equal. This rules out a rectangle (unless it's also a square).

**Step 3:** Find the diagonals of PQRS.

$$PR = \sqrt{((5-(-1))^2 + (\frac{3}{2} - \frac{3}{2})^2)} = \sqrt{36} = 6$$

$$QS = \sqrt{((2-2)^2 + (-1-4)^2)} = \sqrt{25} = 5$$

**Step 4:** Since  $PR \neq QS$ , the diagonals are unequal, so PQRS is **not** a square (a square has equal diagonals). Since all sides are equal and diagonals are unequal, PQRS is a **rhombus**.

**∴ PQRS is a rhombus. All four sides are equal ( $\frac{\sqrt{61}}{2}$ ) but the diagonals  $PR = 6$  and  $QS = 5$  are unequal, confirming it is a rhombus and not a square or rectangle.**

**Board Exam Note:** This type of question typically appears in long answer sections of CBSE board papers. Showing step-by-step working is mandatory.

## Formula Reference Table — Coordinate Geometry Class 10

Formula Name	Formula	Variables Defined
Distance Formula	$d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$	$d$ = distance between two points
Section Formula (Internal)	$(\frac{mx_2+nx_1}{m+n}, \frac{my_2+ny_1}{m+n})$	$m:n$ = ratio of division
Mid-Point Formula	$(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2})$	Special case of section formula (1:1)
Area of Triangle	$\frac{1}{2} x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2) $	Vertices: $(x_1, y_1), (x_2, y_2), (x_3, y_3)$
Centroid	$(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3})$	Intersection of all three medians
Collinearity Condition	$x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2)=0$	Area = 0 means points are collinear

## Extra Solved Examples Beyond NCERT — Coordinate Geometry

### Extra Example 1

Medium

Find the area of a triangle whose vertices are (1, -1), (-4, 6) and (-3, -5).

**Step 1:** Apply area formula with  $x_1=1, y_1=-1, x_2=-4, y_2=6, x_3=-3, y_3=-5$ :

$$\begin{aligned} \text{Area} &= \frac{1}{2}|1(6-(-5)) + (-4)((-5)-(-1)) + (-3)((-1)-6)| \\ &= \frac{1}{2}|1(11) + (-4)(-4) + (-3)(-7)| \\ &= \frac{1}{2}|11 + 16 + 21| = \frac{1}{2} \times 48 = 24 \text{ sq. units} \end{aligned}$$

**Area = 24 sq. units**

### Extra Example 2

Medium

Find the value of  $k$  if the points  $A(2, 3)$ ,  $B(4, k)$  and  $C(6, -3)$  are collinear.

**Step 1:** For collinearity, area = 0:

$$\begin{aligned} 2(k-(-3)) + 4((-3)-3) + 6(3-k) &= 0 \\ 2k + 6 - 24 + 18 - 6k &= 0 \\ -4k + 0 &= 0 \Rightarrow k = 0 \end{aligned}$$

**$k = 0$**

### Extra Example 3

Hard

The vertices of a triangle are  $A(3, 4)$ ,  $B(-4, 3)$  and  $C(8, -6)$ . Find the centroid of the triangle.

**Step 1:** Apply centroid formula:

$$G = \left( \frac{(3+(-4)+8)}{3}, \frac{(4+3+(-6))}{3} \right) = \left( \frac{7}{3}, \frac{1}{3} \right)$$

**Centroid  $G = (7/3, 1/3)$**

## Important Questions for CBSE Board Exam — Coordinate Geometry Ex 7.4

### 1-Mark Questions

**Q1.** What is the condition for three points to be collinear?

**Answer:** Three points are collinear if the area of the triangle formed by them is zero, i.e.,  
 $x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2) = 0$ .

**Q2.** State the centroid formula for a triangle with vertices  $A(x_1, y_1)$ ,  $B(x_2, y_2)$ ,  $C(x_3, y_3)$ .

**Answer:**  $G = \left( \frac{(x_1 + x_2 + x_3)}{3}, \frac{(y_1 + y_2 + y_3)}{3} \right)$ .

**Q3.** In what ratio does the centroid divide each median?

**Answer:** The centroid divides each median in the ratio 2:1 from the vertex.

### 3-Mark Questions

**Q4.** Find the area of the triangle with vertices A(0, 0), B(3, 0) and C(0, 4).

**Answer:** Area =  $\frac{1}{2}|0(0-4)+3(4-0)+0(0-0)| = \frac{1}{2}|12| = 6$  sq. units.

**Q5.** Determine if points P(2, 1), Q(5, -8) and R(4, -3) are collinear.

**Answer:** Area =  $\frac{1}{2}|2(-8-(-3))+5((-3)-1)+4(1-(-8))| = \frac{1}{2}|-10-20+36| = \frac{1}{2}|6| = 3 \neq 0$ . Not collinear.

### 5-Mark Questions

**Q6.** The vertices of  $\triangle ABC$  are A(1, 2), B(4, 6) and C(7, 2). Find the centroid and verify that it lies on all three medians.

**Answer:** Centroid G =  $((1+4+7)/3, (2+6+2)/3) = (4, 10/3)$ . Midpoint of BC =  $(11/2, 4)$ . Show that G lies on the line from A to midpoint of BC using the section formula with ratio 2:1 to verify.

## Common Mistakes Students Make in Coordinate Geometry Ex 7.4

**Mistake 1:** Forgetting the modulus (absolute value) in the area formula.

**Why it's wrong:** Area is always positive. Without the modulus, you may get a negative value which has no geometric meaning.

**Correct approach:** Always write  $\frac{1}{2}|...|$  and take the absolute value before writing the final answer.

**Mistake 2:** Confusing the order of coordinates in the section formula.

**Why it's wrong:** The section formula  $(mx_2+nx_1)/(m+n)$  uses the ratio m:n where m is the part closer to  $(x_2, y_2)$ . Swapping gives the wrong point.

**Correct approach:** Always label the ratio clearly as m:n and match it to the correct vertex.

**Mistake 3:** Not verifying whether the division is internal or external.

**Why it's wrong:** A negative ratio value means external division, which uses a different formula.

**Correct approach:** If k is positive in k:1, it is internal; if negative, it is external.

**Mistake 4:** Using the distance formula instead of the midpoint formula to find the median's midpoint.

**Why it's wrong:** The distance formula gives the length, not the coordinates of the midpoint.

**Correct approach:** Always use  $M = ((x_1+x_2)/2, (y_1+y_2)/2)$  for midpoints.

**Mistake 5:** Concluding PQRS is a square just because all sides are equal.

**Why it's wrong:** A rhombus also has all sides equal. You must also check whether the diagonals are equal to distinguish between a square and a rhombus.

**Correct approach:** Check both side lengths AND diagonal lengths before classifying the quadrilateral.

## Exam Tips for 2026-27 — CBSE Class 10 Maths Chapter 7

### Coordinate Geometry

- **Show all steps:** The 2026-27 CBSE marking scheme awards marks for each correct step. Even if your final answer is wrong, you earn step marks.
- **Use the standard formula format:** Write the area formula first, then substitute values. Examiners follow a set marking scheme and expect this sequence.
- **Check collinearity with area = 0:** This is faster than slope comparison and is the method NCERT uses — stick to it in board exams.
- **Label your ratio correctly:** When using the section formula, always write the ratio as m:n and identify which point corresponds to m and which to n before substituting.
- **For quadrilateral classification:** Always compute all four side lengths AND both diagonals. This is the only way to distinguish between a square, rectangle, and rhombus in coordinate geometry.
- **Chapter weightage in 2026-27:** Coordinate Geometry carries 6 marks. Expect 1 question of 2 marks and 1 question of 4 marks from this chapter in the standard CBSE board paper.

## Frequently Asked Questions — Coordinate Geometry NCERT Solutions Ex 7.4

### How to find area of triangle using coordinates in class 10?

Use the formula:  $\text{Area} = (1/2)|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$ . Substitute the x and y coordinates of all three vertices carefully. Always apply the absolute value to ensure a positive result. If the area equals zero, the three points are collinear. This is the standard method used in NCERT Class 10 Maths Chapter 7 and tested directly in CBSE board exams.

### **What is the centroid formula in coordinate geometry class 10 NCERT?**

The centroid of a triangle with vertices  $A(x_1, y_1)$ ,  $B(x_2, y_2)$ ,  $C(x_3, y_3)$  is  $G = ((x_1 + x_2 + x_3)/3, (y_1 + y_2 + y_3)/3)$ . The centroid is the point of intersection of all three medians and divides each median in the ratio 2:1 from the vertex. This formula is derived and proved in Question 7 of NCERT Class 10 Maths Chapter 7 Exercise 7.4.

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### **How do you check if three points are collinear in class 10 maths NCERT?**

Three points are collinear if the area of the triangle formed by them equals zero. Substitute the coordinates into the area formula and check if the result is 0. This is the fastest and most reliable method for CBSE board exams. The NCERT textbook uses this method in Exercise 7.4 Question 2 to find the relation between  $x$  and  $y$  for collinear points.

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### **Is NCERT Solutions Class 10 Maths Chapter 7 Ex 7.4 in the current 2026-27 CBSE syllabus?**

Yes, Exercise 7.4 of NCERT Class 10 Maths Chapter 7 is fully included in the 2026-27 CBSE syllabus. It covers area of triangle, collinearity, centroid, and quadrilateral classification using coordinates — all of which are tested in CBSE board exams. Make sure to practise all 8 questions from this exercise for complete preparation.

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### **Where can I download NCERT maths book class 10 solutions PDF free for chapter 7?**

You can download free NCERT Solutions for Class 10 Maths Chapter 7 from [ncertbooks.net](https://ncertbooks.net). The PDF covers all four exercises (7.1 to 7.4) with complete step-by-step solutions, updated for the 2026-27 CBSE syllabus. Click the green download button at the top of this page. You can also access the original NCERT textbook from the official NCERT website at [ncert.nic.in](https://ncert.nic.in).

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