# NCERT Solutions for Class 10 Maths Chapter 3 Ex 3.5 | Updated 2026-27

⚡ **Quick Revision Box — Chapter 3 Ex 3.5**

- **Chapter:** Pair of Linear Equations in Two Variables — Exercise 3.5
- **Methods covered:** Cross-multiplication method, Substitution method
- **Unique solution condition:** $a_1/a_2 \neq b_1/b_2$
- **No solution condition:** $a_1/a_2 = b_1/b_2 \neq c_1/c_2$
- **Infinitely many solutions:** $a_1/a_2 = b_1/b_2 = c_1/c_2$
- **Cross-multiplication formula:** $(x)/(b_1c_2 - b_2c_1) = (y)/(c_1a_2 - c_2a_1) = (1)/(a_1b_2 - a_2b_1)$
- **Total questions in Ex 3.5:** 4 questions (with sub-parts)
- **Board exam weightage:** Linear Equations chapter carries 6–8 marks in CBSE Class 10

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The **NCERT Solutions for Class 10 Maths Chapter 3 Ex 3.5** on this page are fully updated for the **2026-27 CBSE board exam**. Exercise 3.5 is part of Chapter 3 — Pair of Linear Equations in Two Variables — from the [NCERT official textbook](#). This exercise focuses on determining whether a pair of linear equations has a unique solution, no solution, or infinitely many solutions, and on solving them using the cross-multiplication and substitution methods. You can find all [NCERT Solutions](#) and specifically [NCERT Solutions for Class 10](#) on our website.

## NCERT Solutions for Class 10 Maths Chapter 3 Ex 3.5 — Chapter Overview

Chapter 3 of Class 10 NCERT Maths deals with the **Pair of Linear Equations in Two Variables**. Exercise 3.5 specifically covers two powerful algebraic techniques: the **cross-multiplication method** and a combined application of the **substitution method**. It also tests your ability to identify whether a given system is consistent (unique or infinite solutions) or inconsistent (no solution).

For the **2026-27 CBSE board exam**, this chapter typically carries 6–8 marks. Questions from this exercise appear as 2-mark, 3-mark, and 5-mark problems. Word problems (Question 4) are high-frequency in board papers. Mastering the consistency conditions and the cross-multiplication formula will help you score full marks.

Prerequisites for this exercise: understanding of linear equations in one variable, basic algebra, and the graphical interpretation of solutions (covered in earlier exercises of this chapter).

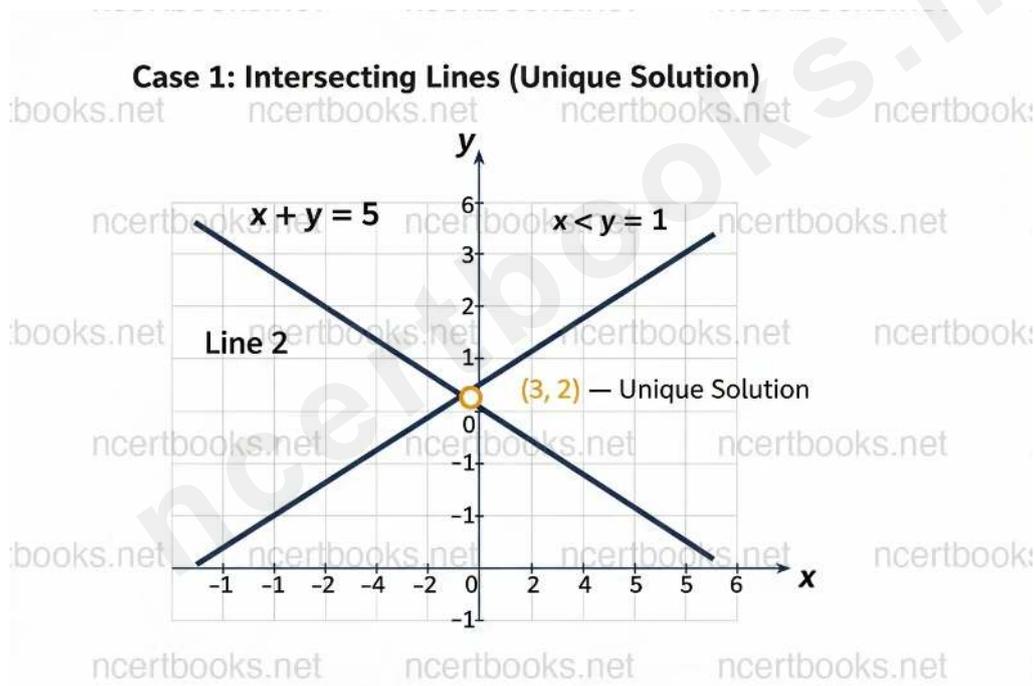| Detail | Information |
| --- | --- |
| Chapter | Chapter 3 — Pair of Linear Equations in Two Variables |
| Exercise | Exercise 3.5 |
| Textbook | NCERT Mathematics Class 10 |
| Class | Class 10 |
| Subject | Mathematics |
| Marks Weightage | 6–8 marks (Chapter 3 overall) |
| Difficulty Level | Medium to Hard |
| Academic Year | 2026-27 |



Fig 3.1: Intersecting lines — unique solution at point of intersection

## Key Concepts — Consistency Conditions and Methods

Before solving Exercise 3.5, you must know these three core concepts. They appear directly in Question 1 and Question 2.

### Consistency Conditions for a Pair of Linear Equations

For the general pair $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$:

- **Unique solution (consistent):** $a_1/a_2 \neq b_1/b_2$ — lines intersect at one point.

- **No solution (inconsistent):** $a_1/a_2 = b_1/b_2 \neq c_1/c_2$ — lines are parallel.
- **Infinitely many solutions (dependent):** $a_1/a_2 = b_1/b_2 = c_1/c_2$ — lines are coincident.

## Cross-Multiplication Method

For equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$, the cross-multiplication formula is:

$$(x)/(b_1c_2 - b_2c_1) = (y)/(c_1a_2 - c_2a_1) = (1)/(a_1b_2 - a_2b_1)$$

This gives: $x = (b_1c_2 - b_2c_1)/(a_1b_2 - a_2b_1)$ and $y = (c_1a_2 - c_2a_1)/(a_1b_2 - a_2b_1)$

## Substitution Method — Quick Recap

Express one variable (say y) from one equation. Substitute this expression into the second equation to get a single-variable equation. Solve for that variable, then back-substitute to find the other.

# Formula Reference Table — Class 10 Maths Chapter 3

| Formula Name | Formula | Variables Defined |
|---|---|---|
| Unique solution condition | $a_1/a_2 \neq b_1/b_2$ | $a_1, a_2$ = x-coefficients; $b_1, b_2$ = y-coefficients |
| No solution condition | $a_1/a_2 = b_1/b_2 \neq c_1/c_2$ | $c_1, c_2$ = constants |
| Infinitely many solutions | $a_1/a_2 = b_1/b_2 = c_1/c_2$ | All coefficients proportional |
| Cross-multiplication (x) | $x = (b_1c_2 - b_2c_1)/(a_1b_2 - a_2b_1)$ | Standard form: $a\_ix + b\_iy + c\_i = 0$ |
| Cross-multiplication (y) | $y = (c_1a_2 - c_2a_1)/(a_1b_2 - a_2b_1)$ | Denominator same as for x |

# Exercise 3.5 — Step-by-Step NCERT Solutions (All Questions)

Below are complete, original solutions for all 4 questions of Exercise 3.5. These **ncert solutions for class 10 maths chapter 3 ex 3 5** follow the CBSE marking scheme for 2026-27. Show every step in your board exam answer to earn full marks.

## Question 1 — Unique Solution, No Solution, or Infinitely Many Solutions

**Question 1**

Medium

Which of the following pairs of linear equations has unique solution, no solution or infinitely many solutions. In case there is a unique solution, find it by using cross-multiplication method.

**(i) x - 3y - 3 = 0, 3x - 9y - 2 = 0**

**Step 1:** Identify coefficients. $a_1 = 1,\ b_1 = -3,\ c_1 = -3$ and $a_2 = 3,\ b_2 = -9,\ c_2 = -2$.

**Step 2:** Compare ratios:

$$a_1/a_2 = 1/3, \; b_1/b_2 = -3/-9 = 1/3, \; c_1/c_2 = -3/-2 = 3/2$$

**Step 3:** Since $a_1/a_2 = b_1/b_2 \neq c_1/c_2$, i.e., $1/3 = 1/3 \neq 3/2$, the lines are parallel.

∴ **No solution (Inconsistent system).**

**(ii) 2x + y = 5, 3x + 2y = 8**

**Step 1:** Rewrite in standard form: $2x + y - 5 = 0$ and $3x + 2y - 8 = 0$.

Coefficients: $a_1 = 2,\ b_1 = 1,\ c_1 = -5$ and $a_2 = 3,\ b_2 = 2,\ c_2 = -8$.

**Step 2:** Compare ratios:

$$a_1/a_2 = 2/3, \; b_1/b_2 = 1/2$$

Since $2/3 \neq 1/2$, the system has a **unique solution**.

**Step 3:** Apply cross-multiplication:

$$(x)/(b_1c_2 - b_2c_1) = (y)/(c_1a_2 - c_2a_1) = (1)/(a_1b_2 - a_2b_1)$$

$$(x)/((1)(-8) - (2)(-5)) = (y)/((-5)(3) - (-8)(2)) = (1)/((2)(2) - (3)(1))$$

$$(x)/(-8 + 10) = (y)/(-15 + 16) = (1)/(4 - 3)$$

$$x/2 = y/1 = 1/1$$

**Step 4:** Therefore $x = 2$ and $y = 1$.

*Why does this work?* Cross-multiplication uses the determinant of the coefficient matrix to find both unknowns simultaneously.

**Verification:** $2(2) + 1 = 5$ ✓ and $3(2) + 2(1) = 8$ ✓

∴ **Unique solution: $x = 2,\ y = 1$**

**(iii) 3x - 5y = 20, 6x - 10y = 40**

**Step 1:** Rewrite: $3x - 5y - 20 = 0$ and $6x - 10y - 40 = 0$.

Coefficients: $a_1 = 3,\ b_1 = -5,\ c_1 = -20$ and $a_2 = 6,\ b_2 = -10,\ c_2 = -40$.

**Step 2:** Compare ratios:

$$a_1/a_2 = 3/6 = 1/2, \quad b_1/b_2 = -5/-10 = 1/2, \quad c_1/c_2 = -20/-40 = 1/2$$

**Step 3:** Since $a_1/a_2 = b_1/b_2 = c_1/c_2 = 1/2$, the two equations represent the same line.

∴ **Infinitely many solutions (Dependent system).**

**(iv) x - 3y - 7 = 0, 3x - 3y - 15 = 0**

**Step 1:** Coefficients: $a_1 = 1,\ b_1 = -3,\ c_1 = -7$ and $a_2 = 3,\ b_2 = -3,\ c_2 = -15$.

**Step 2:** Compare ratios:

$$a_1/a_2 = 1/3, \quad b_1/b_2 = -3/-3 = 1$$

Since $1/3 \neq 1$, the system has a **unique solution**.

**Step 3:** Apply cross-multiplication:

$$(x)/((-3)(-15) - (-3)(-7)) = (y)/((-7)(3) - (-15)(1)) = (1)/((1)(-3) - (3)(-3))$$

$$(x)/(45 - 21) = (y)/(-21 + 15) = (1)/(-3 + 9)$$

$$x/24 = y/-6 = 1/6$$

**Step 4:** $x = 24/6 = 4$ and $y = -6/6 = -1$.

**Verification:** $4 - 3(-1) - 7 = 4 + 3 - 7 = 0$ ✓ and $3(4) - 3(-1) - 15 = 12 + 3 - 15 = 0$ ✓

∴ **Unique solution: x = 4,\ y = -1**

**Board Exam Note:** This type of question typically appears in 2-3 mark sections of CBSE board papers. Always write the ratio comparison clearly — examiners award marks for showing $a_1/a_2$, $b_1/b_2$, $c_1/c_2$ before stating the conclusion.

## Question 2 — Finding Values of a, b, and k

**Question 2**

Hard

**(i) For which values of a and b does the following pair have infinitely many solutions?**

2x + 3y = 7 and (a - b)x + (a + b)y = 3a + b - 2

**Step 1:** Rewrite in standard form:

Equation 1: $2x + 3y - 7 = 0$, so $a_1 = 2, b_1 = 3, c_1 = -7$.

Equation 2: $(a-b)x + (a+b)y - (3a+b-2) = 0$, so $a_2 = a-b, b_2 = a+b, c_2 = -(3a+b-2)$.

**Step 2:** For infinitely many solutions: $a_1/a_2 = b_1/b_2 = c_1/c_2$

$$2/a-b = 3/a+b = (7)/(3a+b-2)$$

**Step 3:** From the first two ratios:

$$2/a-b = 3/a+b$$

$$2(a+b) = 3(a-b)$$

$$2a + 2b = 3a - 3b$$

$$5b = a \Rightarrow a = 5b \ ...(I)$$

**Step 4:** From the first and third ratios:

$$2/a-b = (7)/(3a+b-2)$$

$$2(3a+b-2) = 7(a-b)$$

$$6a + 2b - 4 = 7a - 7b$$

$$9b - 4 = a \Rightarrow a = 9b - 4 \ ...(II)$$

**Step 5:** Substitute (I) into (II):

$$5b = 9b - 4$$

$$4 = 4b$$

$$b = 1$$

From (I): $a = 5(1) = 5$.

**Verification:** $2/5-1 = 2/4 = 1/2$, $3/5+1 = 3/6 = 1/2$, $(7)/(15+1-2) = 7/14 = 1/2$ ✓

∴ **a = 5, b = 1** gives infinitely many solutions.

**(ii) For which value of k will the following pair have no solution?**

$3x + y = 1$ and $(2k-1)x + (k-1)y = 2k+1$

**Step 1:** Rewrite: $3x + y - 1 = 0$ and $(2k-1)x + (k-1)y - (2k+1) = 0$.

$a_1 = 3, b_1 = 1, c_1 = -1$ and $a_2 = 2k-1, b_2 = k-1, c_2 = -(2k+1)$.

**Step 2:** For no solution: $a_1/a_2 = b_1/b_2 \neq c_1/c_2$

$$(3)/(2k-1) = 1/k-1$$

$$3(k-1) = 1(2k-1)$$

$$3k - 3 = 2k - 1$$

$$k = 2$$

**Step 3:** Verify the inequality condition $b_1/b_2 \neq c_1/c_2$:

When $k = 2$: $b_1/b_2 = 1/2-1 = 1/1 = 1$ and $c_1/c_2 = (-1)/(-(2\times2+1)) = -1/-5 = 1/5$.

Since $1 \neq 1/5$, the no-solution condition is satisfied.

∴ **k = 2** gives no solution.

**Board Exam Note:** Questions on finding the value of k or a, b appear frequently in long answer sections of CBSE board papers. Always verify your answer by checking both the equality and inequality conditions.

## Question 3 — Substitution and Cross-Multiplication Methods

### Question 3

Medium

Solve the following pair of linear equations by the substitution and cross-multiplication methods: 8x + 5y = 9, 3x + 2y = 4

### Method 1: Substitution Method

**Step 1:** From Equation 2, express x in terms of y:

$$3x + 2y = 4 \Rightarrow x = (4 - 2y)/(3)$$

**Step 2:** Substitute into Equation 1 (8x + 5y = 9):

$$8 \times (4 - 2y)/(3) + 5y = 9$$

$$(32 - 16y)/(3) + 5y = 9$$

Multiply throughout by 3:

$$32 - 16y + 15y = 27$$

$$32 - y = 27$$

$$y = 5$$

**Step 3:** Substitute y = 5 back:

$$x = (4 - 2(5))/(3) = (4 - 10)/(3) = -6/3 = -2$$

**Verification:** $8(-2) + 5(5) = -16 + 25 = 9$ ✓ and $3(-2) + 2(5) = -6 + 10 = 4$ ✓

∴ **By substitution: x = -2,\ y = 5**

**Method 2: Cross-Multiplication Method**

**Step 1:** Rewrite in standard form: $8x + 5y - 9 = 0$ and $3x + 2y - 4 = 0$.

$a_1 = 8,\ b_1 = 5,\ c_1 = -9$ and $a_2 = 3,\ b_2 = 2,\ c_2 = -4$.

**Step 2:** Apply the cross-multiplication formula:

$$(x)/(b_1 c_2 - b_2 c_1) = (y)/(c_1 a_2 - c_2 a_1) = (1)/(a_1 b_2 - a_2 b_1)$$

$$(x)/((5)(-4) - (2)(-9)) = (y)/((-9)(3) - (-4)(8)) = (1)/((8)(2) - (3)(5))$$

$$(x)/(-20 + 18) = (y)/(-27 + 32) = (1)/(16 - 15)$$

$$x/-2 = y/5 = 1/1$$

**Step 3:** Therefore $x = -2$ and $y = 5$.

*Why does this work?* Both methods give the same answer, confirming the solution is correct. Cross-multiplication is more direct for this type of equation.

∴ **By cross-multiplication: x = -2,\ y = 5**

**Board Exam Note:** When a question asks you to solve by both methods, write both methods clearly with headings. CBSE examiners award marks for each method separately.

## Question 4 — Word Problems (Algebraic Method)

**Question 4**

Hard

Form the pair of linear equations in the following problems and find their solutions (if they exist) by any algebraic method.

**(i) Hostel Charges Problem**

A part of monthly hostel charges is fixed and the remaining depends on the number of days one has taken food in the mess. Student A takes food for 20 days and pays ₹1000. Student B takes food for 26 days and pays ₹1180. Find the fixed charges and the cost of food per day.

**Step 1:** Let fixed charges = ₹x and cost per day = ₹y.

**Step 2:** Form equations:

$$x + 20y = 1000 \text{ ...(1)}$$

$$x + 26y = 1180 \text{ ...(2)}$$

**Step 3:** Subtract (1) from (2):

$$6y = 180 \Rightarrow y = 30$$

**Step 4:** Substitute $y = 30$ in (1):

$$x + 20(30) = 1000 \Rightarrow x = 1000 - 600 = 400$$

**Verification:** $400 + 26(30) = 400 + 780 = 1180$ ✓

∴ **Fixed charges = ₹400; Cost per day = ₹30.**

### (ii) Fraction Problem

A fraction becomes 1/3 when 1 is subtracted from the numerator and becomes 1/4 when 8 is added to its denominator. Find the fraction.

**Step 1:** Let the fraction be x/y.

**Step 2:** Form equations from the given conditions:

$$(x - 1)/(y) = 1/3 \Rightarrow 3(x - 1) = y \Rightarrow 3x - y = 3 \text{ ...(1)}$$

$$(x)/(y + 8) = 1/4 \Rightarrow 4x = y + 8 \Rightarrow 4x - y = 8 \text{ ...(2)}$$

**Step 3:** Subtract (1) from (2):

$$x = 5$$

**Step 4:** Substitute $x = 5$ in (1):

$$3(5) - y = 3 \Rightarrow y = 12$$

**Verification:** 5-1/12 = 4/12 = 1/3 ✓ and (5)/(12+8) = 5/20 = 1/4 ✓

∴ **The fraction is 5/12.**

### (iii) Yash's Test Marks Problem

Yash scored 40 marks getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks deducted

for each incorrect answer, Yash would have scored 50 marks. How many questions were there in the test?

**Step 1:** Let the number of right answers = x and wrong answers = y.

**Step 2:** Form equations:

$$3x - y = 40 \text{ ...(1)}$$

$$4x - 2y = 50 \Rightarrow 2x - y = 25 \text{ ...(2)}$$

**Step 3:** Subtract (2) from (1):

$$x = 15$$

**Step 4:** Substitute x = 15 in (1):

$$3(15) - y = 40 \Rightarrow y = 45 - 40 = 5$$

**Step 5:** Total questions = x + y = 15 + 5 = 20.

**Verification:** 4(15) - 2(5) = 60 - 10 = 50 ✓

∴ **Total questions in the test = 20. (Right answers = 15, Wrong answers = 5)**

**(iv) Distance-Speed Problem (Places A and B)**

Places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If they travel in the same direction, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. Find the speeds of the two cars.

**Step 1:** Let speed of car from A = x km/h and speed of car from B = y km/h. Assume x > y.

**Step 2:** When travelling in the same direction, the faster car covers 100 km more than the slower car in 5 hours:

$$5x - 5y = 100 \Rightarrow x - y = 20 \text{ ...(1)}$$

**Step 3:** When travelling towards each other, combined distance = 100 km in 1 hour:

$$x + y = 100 \text{ ...(2)}$$

**Step 4:** Add (1) and (2):

$$2x = 120 \Rightarrow x = 60$$

From (2): y = 100 - 60 = 40.

**Verification:** Same direction: 5(60) - 5(40) = 300 - 200 = 100 km ✓. Towards each other: 60 + 40 = 100 km/h, meet in 100/100 = 1 hour ✓.

∴ **Speed of car from A = 60 km/h; Speed of car from B = 40 km/h.**

**(v) Rectangle Dimensions Problem**

The area of a rectangle gets reduced by 9 square units if its length is reduced by 5 units and breadth is increased by 3 units. If we increase the length by 3 units and the breadth by 2 units, the area increases by 67 square units. Find the dimensions of the rectangle.

**Step 1:** Let length = x units and breadth = y units. Original area = xy.

**Step 2:** Condition 1 — area reduces by 9:

$$(x - 5)(y + 3) = xy - 9$$

$$xy + 3x - 5y - 15 = xy - 9$$

$$3x - 5y = 6 \ ...(1)$$

**Step 3:** Condition 2 — area increases by 67:

$$(x + 3)(y + 2) = xy + 67$$

$$xy + 2x + 3y + 6 = xy + 67$$

$$2x + 3y = 61 \ ...(2)$$

**Step 4:** Multiply (1) by 3 and (2) by 5:

$$9x - 15y = 18 \ ...(3)$$

$$10x + 15y = 305 \ ...(4)$$

Add (3) and (4):

$$19x = 323 \Rightarrow x = 17$$

From (2): 2(17) + 3y = 61 ⇒ 3y = 27 ⇒ y = 9.

**Verification:** (17-5)(9+3) = 12 × 12 = 144 = 17 × 9 - 9 = 153 - 9 = 144 ✓ and (17+3)(9+2) = 20 × 11 = 220 = 153 + 67 = 220 ✓

∴ **Length = 17 units; Breadth = 9 units.**

**Board Exam Note:** Word problems from this exercise are very common in long answer sections of CBSE board papers. Always define variables clearly, write both equations, and verify your answer — examiners check all three steps.

# Solved Examples Beyond NCERT — Class 10 Maths Linear Equations

These extra examples help you practise the cross-multiplication and consistency conditions at a slightly higher level, as seen in CBSE sample papers.

**Extra Example 1**

Medium

For what value of p will the pair $px + 3y = p - 3$ and $12x + py = p$ have no solution?

**Step 1:** For no solution: $p/12 = 3/p \neq p-3/p$

$$p/12 = 3/p \Rightarrow p^2 = 36 \Rightarrow p = \pm 6$$

**Step 2:** Check p = 6: $p-3/p = 3/6 = 1/2$ and $3/p = 3/6 = 1/2$. This gives equal ratios — infinitely many solutions, not no solution.

**Step 3:** Check p = -6: $3/p = 3/-6 = -1/2$ and $p-3/p = -9/-6 = 3/2$. Since $-1/2 \neq 3/2$, no solution condition is satisfied.

∴ **p = -6**

**Extra Example 2**

Easy

Solve by cross-multiplication: $2x + y = 35$ and $3x + 4y = 65$.

**Step 1:** Standard form: $2x + y - 35 = 0$ and $3x + 4y - 65 = 0$.

$$(x)/((1)(-65) - (4)(-35)) = (y)/((-35)(3) - (-65)(2)) = (1)/((2)(4) - (3)(1))$$

$$(x)/(-65 + 140) = (y)/(-105 + 130) = (1)/(8 - 3)$$

$$x/75 = y/25 = 1/5$$

**Step 2:** $x = 15,\ y = 5$.

∴ **x = 15,\ y = 5**

### Topic-Wise Important Questions for Board Exam — CBSE Class 10 Maths Chapter 3

**1-Mark Questions**

1. Write the condition for the pair $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ to have no solution. **[Answer: $a_1/a_2 = b_1/b_2 \neq c_1/c_2$]**
2. For what value of k do the equations $2x + 3y = 5$ and $4x + ky = 10$ have infinitely many solutions? **[Answer: k = 6]**
3. The pair $x + 2y = 3$ and $2x + 4y = 7$ — consistent or inconsistent? **[Answer: Inconsistent (no solution)]**

**3-Mark Questions**

1. Solve by cross-multiplication: $3x + 2y = 11$ and $2x + 3y = 4$. **[Answer: x = 5, y = -2]** — Show all ratio steps for full marks.
2. For which value of k does $kx + 2y = k - 2$ and $8x + ky = k$ have no solution? **[Answer: k = -4]**

**5-Mark Questions**

1. A boat goes 30 km upstream and 44 km downstream in 10 hours. It goes 40 km upstream and 55 km downstream in 13 hours. Find the speed of the boat in still water and the speed of the stream. **[Answer: Boat speed = 8 km/h, Stream speed = 3 km/h]** — Form two equations using distance/speed relationships, then solve by elimination or cross-multiplication.

## Common Mistakes Students Make in Exercise 3.5

**Mistake 1:** Forgetting to convert equations to standard form ax + by + c = 0 before applying cross-multiplication.

**Why it's wrong:** The cross-multiplication formula requires c to be on the left side with a negative sign. If you use ax + by = c directly, your signs will be wrong.

**Correct approach:** Always rewrite as ax + by + c = 0 first. For example, $2x + y = 5$ becomes $2x + y - 5 = 0$, so $c_1 = -5$.

**Mistake 2:** Comparing only two ratios instead of all three when checking consistency.

**Why it's wrong:** For infinitely many solutions, all three ratios must be equal. For no solution, the third ratio must be different. Checking only two ratios can lead to wrong conclusions.

**Correct approach:** Always compute $a_1/a_2$, $b_1/b_2$, and $c_1/c_2$ — all three.

**Mistake 3:** In word problems, not defining variables clearly before writing equations.

**Why it's wrong:** CBSE examiners deduct marks if variables are not defined. Also, undefined variables lead to equation-formation errors.

**Correct approach:** Start with "Let x = ... and y = ..." and then write equations.

**Mistake 4:** Mixing up the cross-multiplication formula — writing $b_1c_2 - b_2c_1$ for y instead of x.

**Why it's wrong:** The formula for x uses $b_1c_2 - b_2c_1$ in the numerator, and for y uses $c_1a_2 - c_2a_1$. These are different and must not be swapped.

**Correct approach:** Memorise the formula as a cyclic pattern: x → (b, c); y → (c, a); denominator → (a, b).

**Mistake 5:** Not verifying the answer after solving.

**Why it's wrong:** CBSE board papers often award 1 mark specifically for verification. Skipping it wastes easy marks.

**Correct approach:** Always substitute your answer back into both original equations and confirm both sides are equal.

## Exam Tips for 2026-27 CBSE Board — Chapter 3 Linear Equations

- **Show ratio comparison:** In the 2026-27 CBSE marking scheme, 1 mark is typically awarded for writing the ratio conditions ($a_1/a_2$, $b_1/b_2$, $c_1/c_2$) before stating the type of solution.
- **Word problems:** These carry the most marks in board papers. Always write: (1) variable definition, (2) both equations, (3) solution steps, (4) answer in context, (5) verification.
- **Cross-multiplication memory trick:** Draw an arrow diagram — write the coefficients in a 2×3 grid and cross-multiply diagonally. This visual method reduces sign errors.
- **Substitution vs. cross-multiplication:** When the question asks for both methods (like Q3), write them as two separate sections with clear headings. You get marks for each method independently.
- **Chapter weightage:** Chapter 3 (Linear Equations) is part of the Algebra unit, which carries approximately 20 marks in the Class 10 CBSE board exam 2026-27. Practise all exercises thoroughly.

- **Last-minute checklist:** Know the three consistency conditions by heart; practise the cross-multiplication formula 10 times; revise all 5 sub-parts of Q4; check signs carefully when computing $c_1$ and $c_2$.

For more chapter-wise solutions, visit our [NCERT Solutions for Class 10](#) hub page.

## Frequently Asked Questions — Class 10 Maths Chapter 3 Ex 3.5

**How do you determine if a pair of linear equations has a unique solution, no solution, or infinitely m**

Compare the ratios $a_1/a_2$, $b_1/b_2$, and $c_1/c_2$. If $a_1/a_2 \neq b_1/b_2$, there is a unique solution. If $a_1/a_2 = b_1/b_2 \neq c_1/c_2$, there is no solution. If all three ratios are equal, there are infinitely many solutions. This is the standard method taught in NCERT Class 10 Chapter 3 and tested in CBSE board exams.

**What is the cross-multiplication method and how do you use it for Class 10 Maths?**

The cross-multiplication method gives you a direct formula to find x and y from two linear equations written in the form $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$. The formula is: $(x)/(b_1c_2 - b_2c_1) = (y)/(c_1a_2 - c_2a_1) = (1)/(a_1b_2 - a_2b_1)$. You identify the six coefficients, substitute, and compute x and y directly. Always convert to standard form first.

**How many questions are in NCERT Class 10 Maths Chapter 3 Exercise 3.5?**

Exercise 3.5 has 4 main questions. Question 1 has 4 sub-parts testing consistency conditions and cross-multiplication. Question 2 has 2 sub-parts on finding values of parameters a, b, and k. Question 3 asks you to solve one pair of equations using both the substitution and cross-multiplication methods. Question 4 has 5 word problem sub-parts covering hostel charges, fractions, test marks, speed-distance, and rectangle dimensions.

**For which value of k will the pair of linear equations 3x + y = 1 and (2k–1)x + (k–1)y = (2k+1) have no**

For no solution, we need $(3)/(2k-1) = 1/k-1 \neq (1)/(2k+1)$. From the equality: $3(k-1) = 2k-1$, giving $3k - 3 = 2k - 1$, so $k = 2$. Checking the inequality: when $k = 2$, $b_1/b_2 = 1$ and $c_1/c_2 = 1/5$. Since $1 \neq 1/5$, the no-solution condition is confirmed. Therefore $k = 2$.

**What is the difference between the substitution method and the cross-multiplication method in Clas**

In the substitution method, you express one variable from one equation and substitute into the other — it works in steps. In the cross-multiplication method, you apply a single formula using all six coefficients to find both x and y at once. Cross-multiplication is generally faster for equations with large or fractional coefficients. The substitution method is easier to understand for beginners. Both methods give the same answer, as shown in Question 3 of Exercise 3.5.