

Linear Inequalities — CBSE Pattern Test 2

Class 11 Maths · 90 minutes · 40 marks · Sections A–D with answer key · Narayan Gurukul Academy

Test 2 — CBSE Pattern (90 minutes, 40 marks)

Class 11 Maths · Linear Inequalities · Narayan Gurukul Academy (ClassApna)

General Instructions: (1) This paper has four sections — Section A (1×10), Section B (2×4), Section C (3×4) and Section D (5×2) — total 40 marks. Time allowed: 90 minutes.
 (2) All questions are compulsory. No overall choice is given; internal choice, where allowed, is clearly marked.
 (3) For MCQ questions choose the single correct option; for VSA answers write a single line.
 (4) Take $g = 10 \text{ m/s}^2$. All symbols carry their usual meaning. Use of a calculator is not permitted.

Section A — MCQ & VSA ($10 \times 1 = 10$ marks)

1. The inequality $2x < 8$ is equivalent to
 - (A) $x < 4$
 - (B) $x > 4$
 - (C) $x < 16$
 - (D) $x > 16$
2. If $a > b$ and $c < 0$, then ac is
 - (A) $< bc$
 - (B) $> bc$
 - (C) $= bc$
 - (D) 0
3. The solution of $x + 1 \geq 3$ and $x - 2 \leq 4$ is
 - (A) $2 \leq x \leq 6$
 - (B) $x \geq 2$
 - (C) $x \leq 6$
 - (D) no solution
4. $|x - 2| < 1$ is equivalent to
 - (A) $1 < x < 3$
 - (B) $x < 3$
 - (C) $x > 1$
 - (D) $x < 1$ or $x > 3$
5. The solution of $|2x - 1| \leq 3$ is
 - (A) $-1 \leq x \leq 2$
 - (B) $x \leq 2$
 - (C) $x \geq -1$
 - (D) $x \leq -1$ or $x \geq 2$
6. The point $(0, 0)$ with respect to $x + y < 5$ lies
 - (A) inside the half-plane of the solution
 - (B) on the boundary line
 - (C) outside the solution region
 - (D) on the y-axis only
7. The feasible region of a system of inequalities is
 - (A) the common region satisfying all inequalities

- (B) the boundary of one inequality
 (C) the origin only
 (D) the x-axis
8. A student has ₹200 and notebooks cost ₹25 each. The maximum number of notebooks is
 (A) 8
 (B) 7
 (C) 9
 (D) 10
9. Solve the system $x > 2$ and $x < 5$.
10. Define the feasible region.

Section B — Short Answer I ($4 \times 2 = 8$ marks)

11. Solve $-3x > 9$.
12. What happens to the inequality sign when both sides are multiplied by a negative number?
13. Solve $|x| > 2$.
14. Does the point (0, 0) satisfy $x + y < 5$?

Section C — Short Answer II ($4 \times 3 = 12$ marks)

15. Solve $3x + 8 > 2$ when x is a natural number.
16. Solve $5(2x - 7) - 3(2x + 3) \leq 0$ and $2x + 19 \leq 6x + 47$.
17. Solve $|x + 3| \geq 5$.
18. Solve the system $x + 2y \leq 8$, $x \geq 0$, $y \geq 0$ graphically.

Section D — Long Answers ($2 \times 5 = 10$ marks)

19. Solve the system $3x - 7 < 5 + x$ and $11 - 5x \leq 1$, and represent the combined solution on a number line. Solve $|2x - 3| \leq 5$.
20. A man wants to cut three lengths from a single piece of board of length 91 cm. The second length is 3 cm longer than the shortest and the third is twice the shortest. What are the possible lengths of the shortest board if the third piece is at least 5 cm longer than the second?

Answer Key (Marking Scheme)

- Q1 — (A) $x < 4$. Q2 — (A) $< bc$. Q3 — (A) $2 \leq x \leq 6$. Q4 — (A) $1 < x < 3$.
- Q5 — (A) $-1 \leq x \leq 2$. Q6 — (A) inside the half-plane of the solution. Q7 — (A) the common region. Q8 — (A) 8.
- Q9 — $2 < x < 5$.
- Q10 — The common region satisfying all the inequalities.
- Q11 — $x < -3$.
- Q12 — It reverses.
- Q13 — $x < -2$ or $x > 2$.
- Q14 — Yes.
- Q15 — $x > -2$, natural numbers $\{1, 2, 3, \dots\}$.
- Q16 — $-7 \leq x \leq 11/2$.

Q17 — $x \leq -8$ or $x \geq 2$.

Q18 — Triangular feasible region in the first quadrant.

Q19 — $2 \leq x < 6$; $-1 \leq x \leq 4$.

Q20 — The shortest board is at least 8 cm and less than 22 cm.