Chapter - 06

LINEAR INEQUALITIES

01. Solve $ax + b > 0$, $a \neq 0$.

02. Find the value of x such that x is an odd natural number and $2 \leq x < 5$.

03. Solve $7x + 9 = 30$

04. Solve $5x - 3 < 3x + 1$, where $x \in N$.

05. Solve $4x + 3 < 6x + 7$.

06. Solve the system of inequalities $3x - 7 < 5+x$, $11 - 5x \leq 1$ and represent the solution on the number line.

07. Solve the inequality for real x : $37 - (3x + 5) \geq 9x - 8(x - 3)$

08. Solve $(x - 3)/(x - 5) > 0$.

09. Solve the inequality $-3 \leq 4 - \frac{7x}{2} \leq 18$

10. Ravi obtained 70 and 75 marks in the first two unit test. Find the minimum marks he should get in the third test to have an average of at least 60 marks.

11. Solve the inequality $7 \leq \frac{(3x+11)}{2} \leq 11$

12. The longest side of the rectangle is five times the shortest side. If the perimeter of the rectangle is at least 120 cm. Find the minimum value of the shortest side.

13. Solve the given inequality and show the graph of the solution on the number line: $\frac{x}{2} \geq \frac{(5x-2)}{3} - \frac{(7x-2)}{3}$

14. IQ of a person is given by the formula. $IQ = \frac{MA}{CA} \times 100$ Where MA is mental age and CA is chronological age. If $80 \leq IQ \leq 140$ for a group of 12 years old children, find the range of their mental age.

15. Find all pairs of consecutive even positive integers, both of which are larger than 5 such that their sum is less than 23.

16. Solve the following system of inequalities graphically: $2x - y > 1$, $x - 2y < -1$.

17. Solve the following system of inequalities graphically: $4x + 3y \leq 60$, $y \geq 2x$, $x \geq 3$, $x, y \geq 0$.

18. Solve the following system of inequalities graphically: $x + 2y \leq 10$, $x + y \geq 1$, $x - y \leq 0$, $x \geq 0$, $y \geq 0$.

19. Solve the inequalities for real x. $\frac{(2x-1)}{3} \geq \frac{(3x-2)}{4} - \frac{(2-x)}{5}$

20. Solve $\frac{3x-4}{2} \geq \frac{x+1}{4} - 1$. Show the graph of the solutions on the number line.

21. A solution of 8% boric acid is to be diluted by adding a 2% boric acid solution to it. The resulting mixture is to be more than 4% but less than 6% boric acid. If we have 640 liters of the 8% solution, how many liters of the 2% solution will have to be added?

22. The marks obtained by a student of Class XI in the first and second terminal examinations are 62 and 48, respectively. Find the number of minimum marks he should get in the annual examination to have an average of at least 60 marks.

23. A man wants to cut three lengths from a single piece of board of length 91 cm. The second length is to be 3 cm longer than the shortest and the third is to be twice as long as the shortest. What are the possible lengths of the shortest board if the third piece is to be at least 5 cm longer than the second?

[Hint: If x is the length of the shortest board, then $x, (x+3)$ *and* $2x$ are the lengths of the second and third pieces, respectively. Thus, $x+(x+3)+2x \leq 91$and $2x \geq (x+3)+5$].

24. The longest side of a triangle is 3 times the shortest side and the third side is 2 cm shorter than the longest side. If the perimeter of the triangle is at least 61 cm, find the minimum length of the shortest side.

25. A shopkeeper sells a product at a price four times more than its actual price. Find the actual price such that the shopkeeper gets a benefit of at least Rs.40.