MATHEMATICS CLASS XI
CHAPTER – 6 LINEAR EQUATION

Q.1. Solve $24x < 100$, when (i) x is a natural number (ii) x is an integer

Q.2. Solve $-12x > 30$, when

(i) x is a natural number (ii) x is an integer

Q.3. Solve $5x - 3 < 7$, when

(i) x is an integer (ii) x is a real number

Q.4. Solve $3x + 8 > 2$, when

(i) x is an integer (ii) x is a real number

Q.5. Solve the given inequality for real x: $4x + 3 < 5x + 7$

Q.6. Solve the given inequality for real x: $3x - 7 > 5x - 1$

Q.7. Solve the given inequality for real x: $3(x - 1) \leq 2(x - 3)$

Q.8. Solve the given inequality for real x: $3(2 - x) \geq 2(1 - x)$

Q.9. Solve the given inequality for real x: $x + \frac{x}{2} + \frac{x}{3} < 11$

Q.10. Solve the given inequality for real x: $\frac{x}{3} > \frac{x}{2} + 1$

Q.11. Solve the given inequality for real x: $\frac{3(x-2)}{5} \leq \frac{5(2-x)}{3}$

Q.12. Solve the given inequality for real x: $\frac{1}{2}\left(\frac{3x}{5} + 4\right) \geq \frac{1}{3}(x - 6)$

Q.13. Solve the given inequality for real x: $2(2x + 3) - 10 < 6(x - 2)$

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Q.14. Solve the given inequality for real x: $37 - (3x + 5) \geq 9x - 8(x - 3)$

Q.15. Solve the given inequality for real x: $\frac{x}{4} < \frac{(5x-2)}{3} - \frac{(7x-3)}{5}$

Q.16. Solve the given inequality for real x: $\frac{(2x-1)}{3} \geq \frac{(3x-2)}{4} - \frac{(2-x)}{5}$

Q.17. Solve the given inequality and show the graph of the solution on number line: $3x - 2 < 2x + 1$

Q.18. Solve the given inequality and show the graph of the solution on number line: $5x - 3 \geq 3x - 5$

Q.19. Solve the given inequality and show the graph of the solution on number line: $3(1 - x) < 2(x + 4)$

Q.20. Solve the given inequality and show the graph of the solution on number line: $\frac{x}{2} \geq \frac{(5x-2)}{3} - \frac{(7x-3)}{5}$

Q.21. Ravi obtained 70 and 75 marks in first two unit test. Find the minimum marks he should get in the third test to have an average of at least 60 marks.

Q.22. To receive Grade 'A' in a course, one must obtain an average of 90 marks or more in five examinations (each of 100 marks). If Sunita's marks in first four examinations are 87, 92, 94 and 95, find minimum marks that Sunita must obtain in fifth examination to get grade 'A' in the course

Q.23. Find all pairs of consecutive odd positive integers both of which are smaller than 10 such that their sum is more than 11.

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Q.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

Q.25. 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 length 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 piece, respectively. Thus, $x = (x + 3) + 2x \leq 91$ and $2x \geq (x + 3) + 5$]

Q.26. Solve the given inequality graphically in two-dimensional plane: $x + y < 5$

Q.27. Solve the given inequality graphically in two-dimensional plane: $2x + y \geq 6$

Q.28. Solve the given inequality graphically in two-dimensional plane: $3x + 4y \leq 12$

Q.29. Solve the given inequality graphically in two-dimensional plane: $y + 8 \geq 2x$

Q.30, Solve the given inequality graphically in two-dimensional plane: $x - y \leq 2$

Q.31. Solve the given inequality graphically in two-dimensional plane: $2x - 3y > 6$

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Q.32. Solve the given inequality graphically in two-dimensional plane: $-3x + 2y \geq -6$

Q.33. Solve the given inequality graphically in two-dimensional plane: $3y - 5x < 30$

Q.34. Solve the given inequality graphically in two-dimensional plane: $y < -2$

Q.35. Solve the given inequality graphically in two-dimensional plane: $x > -3$

Q.36. Solve the following system of inequalities graphically: $x \geq 3, y \geq 2$

Q.37. Solve the following system of inequalities graphically: $3x + 2y \leq 12, x \geq 1, y \geq 2$

Q.38. Solve the following system of inequalities graphically: $2x + y \geq 6, 3x + 4y \leq 12$

Q.39. Solve the following system of inequalities graphically: $x + y \geq 4, 2x - y > 0$

Q.40. Solve the following system of inequalities graphically: $2x - y > 1, x - 2y < -1$

Q.41. Solve the following system of inequalities graphically: $x + y \leq 6, x + y \geq 4$

Q.42. Solve the following system of inequalities graphically: $2x + y \geq 8, x + 2y \geq 10$

Q.43. Solve the following system of inequalities graphically: $x + y \leq 9, y > x, x \geq 0$

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Q.44. Solve the following system of inequalities graphically: $5x + 4y \leq 20, x \geq 1, y \geq 2$

Q.45. Solve the following system of inequalities graphically: $3x + 4y \leq 60, x + 3y \leq 30, x \geq 0, y \geq 0$

Q.46. Solve the following system of inequalities graphically: $2x + y \geq 4, x + y \leq 3, 2x - 3y \leq 6$

Q.47. Solve the following system of inequalities graphically: $x - 2y \leq 3, 3x + 4y \geq 12, x \geq 0, y \geq 1$

Q.48. Solve the following system of inequalities graphically: $4x + 3y \leq 60, y \geq 2x, x \geq 3, x, y \geq 0$

Q.49. Solve the following system of inequalities graphically: $3x + 2y \leq 150, x + 4y \leq 80, x \leq 15, y \geq 0, x \geq 0$

Q.50. Solve the following system of inequalities graphically: $x + 2y \leq 10, x + y \geq 1, x - y \leq 0, x \geq 0, y \geq 0$

Q.51. Solve the inequality $2 \leq 3x - 4 \leq 5$

Q.52. Solve the inequality $6 \leq -3(2x - 4) < 12$

Q.53. Solve the inequality $-3 \leq 4 - \frac{7x}{2} \leq 18$

Q.54. Solve the inequality $-15 < \frac{3(x-2)}{5} \leq 0$

Q.55. Solve the inequality $-12 < 4 - \frac{3x}{-5} \leq 2$

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Q.56. Solve the inequality $7 \le \frac{(3x+11)}{2} \le 11$

Q.57. Solve the inequalities and represent the solution graphically on number line: $5x + 1 > -24$, $5x - 1 < 24$

Q.58. Solve the inequalities and represent the solution graphically on number line: $2(x - 1) < x + 5$, $3(x + 2) > 2 - x$

Q.59. Solve the following inequalities and represent the solution graphically on number line:

$3x - 7 > 2(x - 6)$, $6 - x > 11 - 2x$

Q.60. Solve the inequalities and represent the solution graphically on number line: $5(2x - 7) - 3(2x + 3) \le 0$, $2x + 19 \le 6x + 47$

Q.61. A solution is to be kept between 68°F and 77°F. What is the range in temperature in degree Celsius (C) if the Celsius/Fahrenheit (F) conversion formula is given by $F = \frac{9}{8}C + 32$?

Q.62 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 litres of the 8% solution, how many litres of the 2% solution will have to be added?

Q.63. How many litres of water will have to be added to 1125 litres of the 45% solution of acid so that the resulting mixture will contain more than 25% but less than 30% acid content?

Q.64. IQ of a person is given by the formula

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$$IQ = \frac{MA}{CA} \times 100,$$

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.

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