Question Bank

LINEAR INEQUALITIES

Class 11 - Mathematics

1. If -3x + 17 < -3, then **[1]**

   a) $x \in (-\infty, 10]$ b) $x \in [10, \infty)$

   c) none of these d) $x \in (10, \infty)$

2. Solve the system of inequalities 2x + 5 $\leq$ 0, x - 3 $\leq$ 0. **[1]**

   a) $x \leq \frac{5}{2}$ b) $x \geq -\frac{5}{2}$

   c) $x \geq \frac{5}{2}$ d) $x \leq -\frac{5}{2}$

3. Solve the system of inequalities $4x + 3 \geq 2x + 17$, $3x - 5 < -2$, for the values of x, then **[1]**

   a) no solution b) $\left(-\frac{3}{2}, \frac{2}{5}\right)$

   c) $(-4, 12)$ d) (-2, 2)

4. The solution set for $|3x - 2| \leq \frac{1}{2}$ **[1]**

   a) none of these b) $[\frac{2}{3}, \frac{2}{3}]$

   c) $[\frac{1}{2}, \frac{5}{6}]$ d) $[\frac{5}{6}, \frac{1}{2}]$

5. The solution set of the inequation 3x < 5, when x is a natural number is **[1]**

   a) {1, 2} b) {1}

   c) {4} d) {0, 1}

6. The solution set for (x + 3) + 4 > -2x + 5: **[1]**

   a) none of these b) $\left(\frac{-2}{3}, \infty\right)$

   c) (- ∞, - 2) d) (2, ∞)

7. 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 third length is to be twice as long as the shortest. What are the possible lengths for the shortest board if the third piece is to be at least 5 cm longer than the second? **[1]**

   a) 3 $\leq$ x $\leq$ 91 b) 3 $\leq$ x $\leq$ 5

   c) 5 $\leq$ x $\leq$ 91 d) 8 $\leq$ x $\leq$ 22

8. If $|x + 3| \geq 10$, then **[1]**

   a) x $\in$ (– 13, 7] b) x $\in$ (– 10, 7]

   c) x $\in$ (– ∞, – 13] $\cup$ [8, ∞) d) x $\in$ (–∞, – 13] $\cup$ [7, ∞)

9. The solution set of 6x - 1 > 5 is : **[1]**

   a) none of these b) {x : x > 1, x $\in$ R}

   c) {x : x < 1, x $\in$ N} d) {x : x < 1, x $\in$ W}

10. If a, b, c are real numbers such that $a \leq b$, $c < 0$, then **[1]**

a) $ac \leq bc$ b) $ac > bc$

c) $ac \geq bc$ d) none of these

11. The solution set for $|x| > 7$ **[1]**

a) $(-\infty, -7) \cap (7, \infty)$ b) none of these

c) $(7, \infty)$ d) $(-\infty, -7) \cup (7, \infty)$

12. If a, b, c are real numbers such that $a > b$, $c < 0$ **[1]**

a) $ac > bc$ b) $ac < bc$

c) $ac \geq bc$ d) none of these

13. solution set of the inequations $x \geq 2$, $x \leq -3$ is **[1]**

a) { } b) [-3, 2]

c) (-3, 2) d) [2 , -3]

14. If $x < 5$, then **[1]**

a) $-x > -5$ b) none of these .

c) $-x < 5$ d) $x > -5$

15. The solution set of the inequation $|x + 2| \leq 5$ is **[1]**

a) (-7, 5) b) [-7, 3]

c) (-7, 3) d) [-5, 5]

16. If $\frac{|x-2|}{x-2} \geq 0$, then **[1]**

a) $x \in (-\infty, 2)$ b) $x \in (-\infty, 2]$

c) $x \in [2, \infty)$ d) $x \in (2, \infty)$

17. If $x < 7$, then **[1]**

a) $-x > -7$ b) $-x \geq -7$

c) $-x < -7$ d) $-x \leq -7$

18. If x is a real number and $|x| < 3$, then **[1]**

a) $-3 < x < 3$ b) $x \geq -3$

c) $x \geq 3$ d) $-3 \leq x \leq 3$

19. If x is a real number and $|x| < 5$, then **[1]**

a) $-5 < x < 5$ b) $-5 \leq x \leq 5$

c) $x \geq 5$ d) $x \leq -5$

20. Solve the system of inequalities $x - 2 > 0$, $3x < 18$ **[1]**

a) $2 < x < 6$ b) $1 < x < 3$

c) $3 < x < 18$ d) $-6 < x < -2$

21. Solve the system of inequalities $-2 \leq 6x - 1 < 2$ **[1]**

a) $-\frac{1}{6} \leq x < \frac{1}{2}$

b) $-\frac{1}{6} < x < \frac{3}{2}$

c) none of these

d) $-\frac{1}{7} \leq x > \frac{1}{2}$

22. If x and a are real numbers such that a > 0 and |x| > a, then **[1]**

a) $x \in (-a, \infty)$

b) $x \in (-\infty, -a) \cup (a, \infty)$

c) x ∈ (-a, a)

d) $x \in [-\infty, a]$

23. The solution set for: $\left|\frac{2(3-x)}{5}\right| < \frac{3}{5}$ **[1]**

a) $(\frac{1}{2}, \frac{3}{2})$

b) none of these

c) $(\frac{3}{2}, \frac{9}{2})$

d) $(\frac{1}{4}, \frac{3}{4})$

24. The solution set for: $\frac{|x|-1}{|x|-2} \geq 0, x \neq \pm 2$ **[1]**

a) (-2, 2)

b) $(-\infty, -2) \cup (-1, 1) \cup (2, \infty)$

c) $(-\infty, -2) \cup (2, \infty)$

d) $(-1, 2) \cup (3, \infty)$

25. If $|\ x - 1|\ > 5$, then **[1]**

a) $x \in [6, \infty)$

b) $x \in (6, \infty)$

c) $x \in (-\infty, -4) \cup (6, \infty)$

d) $x \in (-\infty, -4) \cup (6, \infty]$

26. Solve the system of inequalities (x + 5) - 7(x - 2) ≥ 4x + 9, 2(x - 3) - 7(x + 5) ≤ 3x - 9 **[1]**

a) $\frac{-9}{4} \leq$ x ≤ 1

b) $-4 \leq$ x ≤ 1

c) $-1 \leq$ x ≤ 1

d) $-4 \leq$ x ≤ 4

27. Solve: 3x + 5 < x - 7, when x is a real number **[1]**

a) none of these

b) x < -12

c) x < -6

d) x > -6

28. If x belongs to set of integers, A is the solution set of 2(x - 1) < 3x - 1 and B is the solution set of 4x - 3 ≤ 8 + x, find A ∩ B **[1]**

a) {0, 2, 4}

b) {1, 2, 3}

c) {0, 1, 2}

d) {0, 1, 2, 3}

29. Solutions of the inequalities comprising a system in variable x are represented on number lines as given below, then **[1]**

a) x ∈ [– 3, 1]

b) x ∈ (–∞, – 4) ∪ [3, ∞)

c) x ∈ [– 4, 3]

d) x ∈ (– ∞, – 4] ∪ [3, ∞)

30. If $|x + 2| \leq 9$, then **[1]**

a) x ∈ (- 7 , 11)

b) $x \in (-\infty, -7) \cup (11, \infty)$

c) x ∈ [- 11 , 7]

d) $x \in (-7, -\infty) \cup [\infty, 11)$

31. Solve the system of inequalities: x - 5 > 0, $\frac{2x-4}{x+2}$ < 2 **[1]**

a) x > 5

b) none of these

c) x > 2

d) x < -2

32. The solution set of the inequation: $\frac{2x-1}{3} - \frac{3x}{5} + 1 < 0, x \in W$ is: **[1]**

a) none of these

b) x ∈ N

c) null set

d) x ∈ W

33. Solve the system of inequalities: $-15 < \frac{3(x-2)}{5} \leq 0$ **[1]**

a) -13 < x < 13

b) -23 < x ≤ 2

c) -23 < x < 23

d) -13 < x < 2

34. If x and b are real numbers . If b > 0 and |x| > *b*, then **[1]**

a) $x \in [-\infty, b)$

b) $x \in (-b, b)$

c) $x \in (-\infty, -b) \cup (b, \infty)$

d) $x \in (-b, \infty)$

35. Solve the system of inequalities -2 < 1 - 3x < 7 **[1]**

a) -1 < x < 1

b) none of these

c) -2 < x < 2

d) -2 < x < 1

36. Solve: 5x < 24 when $x \in Z$ **[1]**

37. Write the set of values of x satisfying the inequation (x^2 - 2x + 1) (x - 4) ≥ 0. **[1]**

38. Solve inequation and represent the solution set on the number line: $\frac{5x}{4} - \frac{4x-1}{3} > 1$ where $x \in R$ **[1]**

39. Solve $|4 - x| < 2$ **[1]**

40. Solve: $\frac{x-1}{3} + 4 < \frac{x-5}{5} - 2$. **[1]**

41. Solve inequation and represent the solution set on the number line: 3x - 4 > x + 6 where $x \in R$ **[1]**

42. Solve, $0 < \frac{-x}{3} < 1$, x ∈ R. **[1]**

43. Solve: 4x - 2 < 8, when x ∈ N. **[1]**

44. Solve: 5x < 24 when $x \in N$ **[1]**

45. Solve: $\frac{2x+3}{5} - 2 < \frac{3(x-2)}{5}$. **[1]**

46. Solve inequation and represent the solution set on the number line: 5x + 2 < 17 where $x \in R$ **[1]**

47. Solve inequation and represent the solution set on the number line: 5x + 2 < 17 where $x \in Z$ **[1]**

48. Solve: 3x - 7 > x + 1 **[1]**

49. Solve: 12x < 50, when x ∈ R. **[1]**

50. Solve the inequality: $6 \leq -3\,(2x - 4) < 12$ **[1]**

51. Solve: 12x < 50, when x ∈N. **[1]**

52. Solve the inequality: $7 \leq \frac{(3x+11)}{2} \leq 11$ **[1]**

53. Solve: 24x < 100, when x is a natural number. **[1]**

54. Solve for x, the inequalities: $\frac{4}{x+1} \leq 3 \leq \frac{6}{x+1}, (x > 0)$ **[1]**

55. Solve: $\frac{5x-6x}{x+6} < 1$. **[1]**

56. Solve $\frac{|x-3|}{x-3} < 0, x \in R$ **[1]**

57. Solve: $\frac{2x+3}{4} - 3 < \frac{x-4}{3} - 2$. **[1]**

58. Solve the inequality: $-15 < \frac{3(x-2)}{5} \leq 0$ **[1]**

59. Solve inequation and represent the solution set on number line 6x ≤ 25, where $x \in Z$ **[1]**

60. Solve: 12x < 50, when x ∈ Z. **[1]**

61. Solve $|x + 1| > 4, x \in R$ **[1]**

62. Solve: 12x < 50, when **[1]**

i. $x \in R$

ii. $x \in Z$

63. Solve: $\frac{3x-2}{5} \leq \frac{4x-3}{2}$ **[1]**

64. Solve 4x + 3 < 6x +7. **[1]**

65. Solve inequation and represent the solution set on the number line: 3x + 8 > 2, $x \in R$ **[1]**

66. Solve the given system of equations in R. x - 2 > 0, 3x < 18. **[2]**

67. Solve the inequations 2x - 3 < x + 2 < 3x + 5 $x \in R$ draw the graph of the solution set. **[2]**

68. Solve the given system of equations in R. 4x - 1 < 0, 3 - 4x < 0. **[2]**

69. In the first four examinations, each of 100 marks, Mohan got 94, 73, 72 and 84 marks. If a final average greater than or equal to 80 and less than 90 is needed to obtain a final grade B in a course, then what range of marks in the fifth (last) examination will result if Mohan receiving B in the course? **[2]**

70. Solve the given linear inequation: $\frac{x-3}{x-5} > 0$ **[2]**

71. Solve the linear inequality $3x + 12 \leq 0$. **[2]**

72. Find the solution set of the inequation: |2x - 3| > 1 **[2]**

73. Find all pairs of consecutive odd natural numbers, both of which are larger than 10, such that their sum is less than 40. **[2]**

74. Solve the inequalities represent the solution graphically on number line: **[2]**

5x + 1 > -24, 5x - 1 < 24

75. Solve $\frac{x+3}{x-1}$ >0, x ∈ R. **[2]**