

Board – CBSE

Class – 11

Topic – Linear Inequalities

Very Short Answer Type Questions (1 Mark)

1. Solve $5x < 24$ when $x \in \mathbb{N}$
2. Solve $3x < 11$ when $x \in \mathbb{Z}$
3. Solve $3 - 2x < 9$ when $x \in \mathbb{R}$
4. Solve $\frac{1}{x-2} \leq 0$
5. Solve $0 < \frac{-x}{3} < 1$

Write the solution in the form of intervals for $x \in \mathbb{R}$.

6. $\frac{2}{x-3} < 0$
7. $-3 \leq -3x + 2 < 4$
8. $3 + 2x > -4 - 3x$
9. Draw the graph of the solution set of $x + y \geq 4$.
10. Draw the graph of the solution set of $x \leq y$

Short Answer Type Questions (4 Marks)

11. Solve the inequalities for real x

$$\frac{2x-3}{4} + 9 \geq 3 + \frac{4x}{3}$$

12. $\frac{2x+3}{4} - 3 + \frac{x-4}{3} - 2$

13. $-5 \leq \frac{2-3x}{4} \leq 9$

14. $|x-2| \geq 5$

15. $|4-x| + 1 < 3$

16. $\frac{3}{x-2} < 1$

17. $\frac{x}{x-5} > \frac{1}{2}$

18. $\frac{x+3}{x-2} > 0$

19. $x + 2 \leq 5, 3x - 4 > -2 + x$

20. $3x - 7 > 2(x - 6), 6 - x > 11 - 2x$

21. The water acidity in a pool is considered normal when the average PH reading of three daily measurements is between 7.2 and 7.8. If the first two PH readings are 7.48 and 7.85, find the range of PH value for the third reading that will result in the acidity level being normal.

22. While drilling a hole in the earth, it was found that the temperature ($T^{\circ}\text{C}$) at x km below the surface of the earth was given by $T = 30 + 25(x - 3)$, when $3 \leq x \leq 15$. Between which depths will the temperature be between 200°C and 300°C ? Solve the following systems of inequalities graphically:

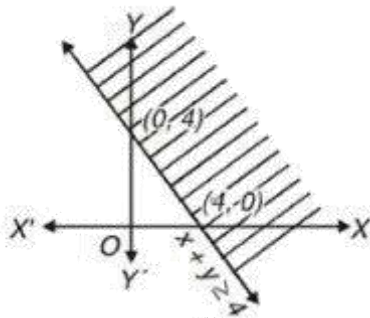
Long Answer Type Questions (6 Marks)

23. Solve the system of inequalities for real x

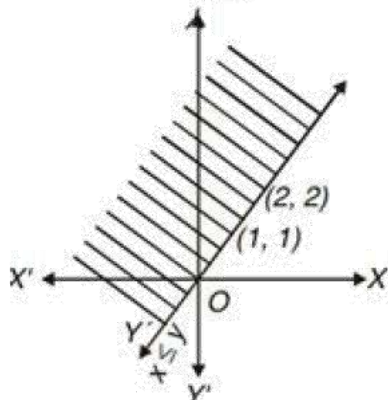
$$\frac{5x}{4} + \frac{3x}{8} > \frac{39}{8} \text{ and } \frac{2x-1}{12} - \frac{x-1}{3} < \frac{3x+1}{4}$$

Answer

1. $\{1,2,3,4\}$
2. $\{\dots, -2, -1, 0, 1, 2, 3\}$
3. $x > -3$
4. $x < 2$
5. $-3 < x < 0$
6. $(-\infty, 3)$
7. $\left[\frac{-2}{3}, \frac{5}{3}\right]$
8. $\left[\frac{-7}{5}, \infty\right]$
- 9.



10.



11. $\left[-\infty, \frac{63}{10}\right]$
12. $\left(-\infty, \frac{13}{2}\right)$
13. $\left[\frac{-34}{3}, \frac{22}{3}\right]$
14. $(-\infty, -3) \cup [7, \infty)$
15. $(2, 6)$
16. $(-\infty, 2) \cup (5, \infty)$
17. $(-\infty, -5) \cup (5, \infty)$
18. $(-\infty, -3) \cup (2, \infty)$
19. $(1, 3]$
20. $(5, \infty)$
21. Between 6.27 and 8.07
22. Between 9.8 m and 13.8 m
23. $(3, \infty)$