MATHS

BOOKS - NAGEEN PRAKASHAN ENGLISH

LINEAR INEQUALITIES

Example

1. Solve the inequation $3x - 8 < -2$ and represent the solution on the number line when

(i) $x \in R$(ii) $x \in Z$

(iii) $x \in N$.

Watch Video Solution

2. solve $2(2x+3)-10<6(x-2)$ and represent this solution on real line.

Watch Video Solution

3. Solve the inequation $\frac{3(x-2)}{5} \leq \frac{5(2-x)}{3}$ and represent this solution on number line.

Watch Video Solution

4. solve the inequation $\frac{2x-3}{4}+9 \geq 3+\frac{4x}{3}$

and represent this solution on number line .

Watch Video Solution

5. solve the inequation $\frac{x+1}{x+3}>1$

Watch Video Solution

6. solve the inequation $\frac{x-2}{x+5}>2.$

Watch Video Solution

7. solve the inequation $\frac{2x+4}{x-1} \geq 5$ and represent this solution on the number line.

Watch Video Solution

8. solve : $-\frac{1}{3} \leq \frac{x}{2} - \frac{4}{3} < \frac{1}{6}$

Watch Video Solution

9. solve : $|3x - 2| \leq 1$

Watch Video Solution

10. Solve : $\frac{2}{|x-3|} > 1, x \neq 3$

Watch Video Solution

11. Solve: $\frac{-1}{|x|-2} \geq 1, wherex \in R, x \neq \pm 2.$

Watch Video Solution

12. solve: $|x-2|+|x-4| \geq 8$

Watch Video Solution

13. solve : $\frac{|x-1|}{x+1} < 1$

A. $x \in (-\infty, -1) \cup (0, \infty)$

B. $x \in (-\infty, -1] \cup (0, \infty)$

C. $x \in (-\infty, -1) \cup [0, \infty)$

D. $x \in (-\infty, \infty)$

Answer: A

Watch Video Solution

14. Find all pairs of consecutive even numbers which are greater than 8 and their sum is smaller then 27.

Watch Video Solution

15. A student scores 65, 62 70 marks is 3 subjects. Find the minimum marks scored by him in 4th subject to get an average of 64 minimun.

Watch Video Solution

16. The largest side of a triangle is twice the smallest side. Its largest side is 3 cm more than the third side. Find the minimum length of the smallest side if the minimum perimeter of the triangle is 62 cm.

Watch Video Solution

17. IQ of a person is given by the formula $IQ = \frac{MA}{CA} \times 100$ where MA = mental age and CA = chronological age. If IQ for a group of 10

years children is given by the inequation $70 \leq IQ \leq 140$, find the range of their mental age.

Watch Video Solution

18. A solution is to be kept between $59^{\circ} F$ and 77° F. What is the range of temperature in degree celcius (C) if the Celcius-farhenheit conversion formula is:

$$F = \frac{9}{5}C + 32$$

Watch Video Solution

19. A manufacturer has 600 liters of 12% solution of acid. How many litres of a 30% acid solution must be added to it so that the acid content in the resulting mixture will be more then 15% but less than 18%?

Watch Video Solution

20. Solve the following inequation graphically:

$2x + 3y \leq 6$

Watch Video Solution

21. solve the inequation $2x - y \geq 3$ by graphical method.

Watch Video Solution

22. Solve the inequation $x + y < 5$ by graphical method.

Watch Video Solution

23. Solve the following system of linear inequation graphically:

$2x + 3y \leq 6,\ 3x + 22y \leq 6,\ x \geq 0,\ y \geq 0$

Watch Video Solution

24. solve the following system of inequation by graphical method : $5x + 4y \leq 40, x \geq 2, y \geq 3$

Watch Video Solution

Exercise

1. Solve the inequation $3x - 2 < 5$ If (i) x $\in$ N (ii) x $\in$ R and represent the solution on the number line

Watch Video Solution

2. Solve the inequation $12x < 50$ If (i) x $\in$ Z (ii) x $\in$ R and represent the solution on the number line

Watch Video Solution

3. Solve the inequation $3x + 8 > 2$If (i) x $\in$ N (ii) X $\in$ R and represent the solution on the number line

Watch Video Solution

4. Solve the inequation $6x - 5 \leq 7$ If (i) x $\in$ I (ii) x $\in$ R and represent the solution on the number line

Watch Video Solution

5. Solve the inequation $30x < 200$ If (i) x $\in$ Z (ii) x $\in$ N and represent the solution on the number line

Watch Video Solution

6. Solve the inequation $5x - 5 \leq -5$ If (i) x $\in$ z (ii) $x$in R and represent the solution on the number line

Watch Video Solution

7. Solve the inequation $3x - 7 < 5x - 3$ If x $\in$ R and represent the solution on the number line

Watch Video Solution

8. Solve the inequation $3(x - 1) \leq 2(x - 3)$ If x $\in$ R and represent the solution on the number line

Watch Video Solution

9. Solve the inequation $5x - 2 \geq 3x - 1$ If x $\in$ R and represent the solution on the number line

Watch Video Solution

10. Solve the inequation $2x + 5 > -5x + 12$ If x $\in$ R and represent the solution on the number line

Watch Video Solution

11. Solve : $\frac{5 - 2x}{3} + 5 \leq \frac{x}{6}$

Watch Video Solution

12. solve : $\frac{3x-4}{2}+1 \geq \frac{x+1}{4}$

Watch Video Solution

13. Solve : $3\left(\frac{3x}{5}+4\right) \geq 2(x-6)$

Watch Video Solution

14. Solve the inequalities for real x :

$$\frac{x}{4} < \frac{(5x-2)}{3} - \frac{(7x-3)}{5}$$

Watch Video Solution

15. Solve : $\frac{x}{2} \geq \frac{5x-8}{3} - \frac{7x-13}{5}$

Watch Video Solution

16. Solve : $\frac{x}{6} \geq \frac{8-3x}{2} + 4$

Watch Video Solution

17. Solve : $x + \frac{x}{2} + \frac{x}{3} > 11$

Watch Video Solution

18. Solve : $\frac{3x}{5} - \frac{2(x-2)}{3} \leq 1$

Watch Video Solution

19. Solve : $2(5x - 7) \geq 3(4x - 5)$

Watch Video Solution

20. Solve : $\frac{5x}{4} - 1 \leq \frac{4x-1}{3}$

Watch Video Solution

21. Solve : $\frac{5x-2}{3} < \frac{4x-7}{2}$

Watch Video Solution

22. Solve : $\frac{x}{4} - 1 < \frac{x}{5} + 2$

Watch Video Solution

23. Solve : $\frac{1}{x-3} < 0$

Watch Video Solution

24. Solve : $\frac{x-1}{x-2} > 1$

Watch Video Solution

25. Solve : $\frac{2}{x+3} \geq 0$

Watch Video Solution

26. Solve : $\frac{x+2}{x+1} < 0$

Watch Video Solution

27. Solve : $\frac{2x-1}{x+2} \leq 3$

Watch Video Solution

28. Solve : $x+2 \geq 0$ and $2x-5 \leq 0$

Watch Video Solution

29. Solve : $5 - 2x < 11$ and $4x - 3 \geq 9$

Watch Video Solution

30. Solve :

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

Watch Video Solution

31. Solve : $\frac{2x-1}{2} \leq 2x + \frac{1}{2} \leq \frac{11}{2} + x$

Watch Video Solution

32. Solve : $6 \leq -3(2x-4) < 12$

Watch Video Solution

33. Solve : $-12 \leq 4 + \frac{3x}{5} \leq 2$

Watch Video Solution

34. Solve : $|x-3| \leq 1$

A.

B.

C.

D.

Answer: N/a

Watch Video Solution

35. Solve : $|x+2|<3$

Watch Video Solution

36. Solve : $|2x-1|>2$

Watch Video Solution

37. Solve : $\left|\frac{1}{2x-1}\right| \leq 3, x \neq 1/2$

Watch Video Solution

38. Solve : $\frac{2}{|x-3|} > 1, x \neq 3$

Watch Video Solution

39. Solve : $\frac{|x|-1}{|x|-2} \geq 0, x \neq \pm 2$

Watch Video Solution

40. Solve : $\frac{|x+4|+x}{x+1} > 1, x \neq -1$

Watch Video Solution

41. Solve : $|x-1|+|x-2| \geq 3$

Watch Video Solution

42. If x satisfies $|x-1|+|x-2|+|x-3| > 6$, then

Watch Video Solution

43. Solve : $|x-3|+|x-5|>9$

Watch Video Solution

44. Find all pairs of consecutive odd integers both of which are smaller than 12 and their sum is more than 11.

Watch Video Solution

45. Find all pairs of consecutive even integers both of which are greater than 7 and their sum is less than 25.

Watch Video Solution

46. Find all pairs of consecutive even integers both of which are greater than 6 and their sum is less than 27.

Watch Video Solution

47. A student obtained 60, 62, 64 and 66 marks in 4 subjects in an examination. Find the minimum marks he should get in 5th subject to have an average of at least 65 marks.

Watch Video Solution

48. A student obtained 62 and 48 marks in the first and secound examinations of class XI. Find the minimum marks he should get in annul examination to have an average of at least 60 marks.

Watch Video Solution

49. 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 tow pH reading 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.

Watch Video Solution

50. The longest side of a triangle is three times the shortest side and the third side is 2 cm shorter than the longest side if the perimeter of the triangles at least 61 cm, find the minimum length of the shortest side.

Watch Video Solution

51. A man wants to cut three lengths from a single piece of board of length 91cm 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

Watch Video Solution

52. A solution is to be kept between $50^\circ F$ and $68^\circ F$. What is the range of temperature in degree celcius if Celcius-farhenheit conversion formual is : $F = \frac{9}{5}C + 32$

Watch Video Solution

53. A solution is to be kept between $40^\circ C$ and $60^\circ C$. What is the range of temperature in farhenheit if Celcius-farhenheit conversion formual is : $F = \frac{9}{5}C + 32$

Watch Video Solution

54. How may 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?

Watch Video Solution

55. 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 there are 640litres of the 8% solution, how many litres of 2% solution will have to be added?

Watch Video Solution

56. If the cost and revenue funcation of a product are respectively $C(x) = 5x + 700$ and $R(x) = 15x + 100$, where x is the number of

products then what will be the value of x to get profit ?

Watch Video Solution

57. Solve $2x + 5y \geq 10$

Watch Video Solution

58. $x - 2y \leq 4$

Watch Video Solution

59. $x + 4y > 8$

Watch Video Solution

60. $3y - 5x < 15$

Watch Video Solution

61. $2x + y \geq 0$

Watch Video Solution

62. $2x + y \leq 6, x + 2y \leq 8, x \geq 0, y \geq 0$

Watch Video Solution

63. Solve the following system of inequations graphically

$x + y \leq 10, x + 3y \leq 15, x \geq 0, y \geq 0$

Watch Video Solution

64. $x + y \leq 10, 4x + 3y \leq 24, x \geq 0, y \geq 0$

Watch Video Solution

65. $x + 2y \leq 40, 2x + y \leq 40, x \geq 0, y \geq 0$

Watch Video Solution

66. $2x + y \geq 6, x + 2y \geq 8, x \geq 0, y \geq 0$

Watch Video Solution

67. Show that the following system of linear inequalities has no solutin $x + 2y \leq 3, 3x + 4y \geq 12, x \geq 0, y \geq 1.$

Watch Video Solution

68.

$x + 2y \leq 10, x + y \geq 1, x - y \leq 0, x \geq 0, y \geq 0$

Watch Video Solution

69. Solve the Following System of Inequalities Graphically

$3x + 4y \leq 60, x \geq 2y, x \geq 1, y \geq 0$

Watch Video Solution

70. Solve the Following System of Inequalities Graphically

$3x + 2y \leq 6, x \geq 1, y \geq 2$

Watch Video Solution

71. Solve the Following System of Inequalities Graphically

$x + y \leq 9, x > y, x \geq 0, y \geq 0$

Watch Video Solution

72. $x - y \leq 2, x + y \leq 4, x \geq 0, y \geq 0$

Watch Video Solution

73. $y - 2x \leq 1, x + y \leq 2, x \geq 0, y \geq 0$

Watch Video Solution

74. $2x - y > 1, 2y - x > 1$

Watch Video Solution

75. $x + y \geq 24, 2x + y \geq 32, x \geq 0, y \geq 0$

Watch Video Solution

76. Solve the given linear inequality and specify the bounded region.

$2x + y \geq 2, x - y \leq 1, x + 2y \leq 8, x \geq 0, y \geq 0$

.

Watch Video Solution

Ncert Question

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

Watch Video Solution

2. Solve $12x > 30$, when (i) x is a natural number. (ii) x is an integer

Watch Video Solution

3. Solve $5x - 3 < 7$, when (i) x is integer. (ii) x is a real number.

Watch Video Solution

4. Solve $3x + 8 > 2$, when (i) x is an integer. (ii) x is a real number.

Watch Video Solution

5. solve the inequalities for real x , $4x + 3 < 5x + 7$

Watch Video Solution

6. solve the inequalities for real x ,

$3x - 7 > 5x - 1$

Watch Video Solution

7. Solve the inequalities for real x :

$3(x - 1) \leq 2(x - 3)$

Watch Video Solution

8. $3(2 - x) \geq 2(1 - x)$

Watch Video Solution

9. Solve the inequalities for real x :

$$x + \frac{x}{2} + \frac{x}{3} < 11$$

Watch Video Solution

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

Watch Video Solution

11. solve the inequalities for real x :

$$\frac{3(x-2)}{5} \leq \frac{5(2-x)}{3}$$

Watch Video Solution

12. solve the inequalities for real x

$$\frac{1}{2}\left(\frac{3x}{5}+4\right) \geq \frac{1}{3}(x-6)$$

Watch Video Solution

13. Solve the inequalities for real x :

$$2(2x+3)-10 < 6(x-2)$$

Watch Video Solution

14. $37 - (3x + 5) \geq 9x - 8(x - 3)$

Watch Video Solution

15. $\frac{x}{4} < \frac{(5x - 2)}{3} - \frac{(7x - 3)}{5}$

Watch Video Solution

16. $\frac{(2x - 1)}{3} \geq \frac{(3x - 2)}{4} - \frac{(2 - x)}{5}$

Watch Video Solution

17. $3x - 2 < 2x + 1$

Watch Video Solution

18. $5x - 3 \geq 3x - 5$

Watch Video Solution

19. $3(1 - x) < 2(x + 4)$

Watch Video Solution

20. $\frac{x}{2} \geq \frac{(5x-2)}{3} - \frac{(7x-3)}{5}$

Watch Video Solution

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.

Watch Video Solution

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 m fifth examin

Watch Video Solution

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

Watch Video Solution

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

Watch Video Solution

25. The longest side of a triangle is three 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.

Watch Video Solution

26. A man wants to cut three lengths from a single piece of board of length 91cm 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

Watch Video Solution

27. Shade the region given by inequality

$x + y < 5$

Watch Video Solution

28. Shade the region given by inequality

$2x + y \geq 6$

Watch Video Solution

29. $3x + 4y \leq 12$

Watch Video Solution

30. GIVEN INEQUATION: $y + 8 \geq 2x$

Watch Video Solution

31. $x - y \leq 2$

Watch Video Solution

32. $2x - 3y > 6$

Watch Video Solution

33. $-3x + 2y \geq -6$

Watch Video Solution

34. $3y - 5x < 30$

Watch Video Solution

35. $y < -2$

Watch Video Solution

36. $x > -3$

Watch Video Solution

37. plot $x \geq 3, y \geq 2$

Watch Video Solution

38. $3x + 2y \leq 12, x \geq 1, y \geq 2$

Watch Video Solution

39. $2x + y \geq 6, 3x + 4y \leq 12$

Watch Video Solution

40. $x + y \geq 4, 2x - y < 0$

Watch Video Solution

41. Solve the linear inequalities

$2x - y > 1, x - 2y < 1$

Watch Video Solution

42. $x + y \leq 6, x + y \geq 4$

Watch Video Solution

43. $2x + y \geq 8, x + 2y \geq 10$

Watch Video Solution

44. Find common region of given inequation

$x + y \leq 9, x > y, x \geq 0$

Watch Video Solution

45. Solve the system of inequalities graphically :

$5x + 4y \leq 20, x \geq 1, y \geq 2$

Watch Video Solution

46. Find the common region of given inequation

$3x + 4y \leq 60, x + 3y \leq 30, x \geq 0, y \geq 0$

Watch Video Solution

47. Solve the linear inequalities.

$2x + y \geq 4, x + y \leq 3, 2x - 3y \leq 6$

Watch Video Solution

48. Show that the following system of linear inequalities has no solutin

$x + 2y \leq 3, 3x + 4y \geq 12, x \geq 0, y \geq 1.$

Watch Video Solution

49. $4x + 3y \leq 60, y \geq 2x, x \geq 3, x, y \geq 0$

Watch Video Solution

50. Show the common solution of given inequalities and shade the region bounded by them .

$3x + 2y \leq 150, x + 4y \leq 80, x \leq 15, y \geq 0, x \geq 0$

Watch Video Solution

51.

$x + 2y \leq 10, x + y \geq 1, x - y \leq 0, x \geq 0, y \geq 0$

Watch Video Solution

Miscellaneous Exercise

1. $2 \leq 3x - 4 \leq 5$ find x

Watch Video Solution

2. $6 \leq -3(2x - 4) < 12$

Watch Video Solution

3. $-3 \leq 4 - \frac{7x}{2} \leq 10$

Watch Video Solution

4. $-15 < \frac{3(x-2)}{5} \leq 0$

Watch Video Solution

5. $-12 < 4 - \frac{3x}{-5} \leq 2$

Watch Video Solution

6. $7 \leq \frac{(3x+11)}{2} \leq 11$

Watch Video Solution

7. $5x + 1 > -24, 5x - 1 < 24$

Watch Video Solution

8. $2(X-1) < X + 5, 3(X+2) > 2 - X$

Watch Video Solution

9. $3x - 7 > 2(x - 6), 6 - x > 11 - 2x$

Watch Video Solution

10.

$5(2x - 7) - 3(2x + 3) \leq 0, 2x + 19 \leq 6x + 47$

Watch Video Solution

11. A solution is to be kept between $68oF$ and $77oF$. What is the range in temperature in

degree Celsius (C) if the Celsius / Fahrenheit (F) conversion formula is given by $F = \frac{9}{5}C + 32$?

Watch Video Solution

12. 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 there are 640litres of the 8% solution, how many litres of 2% solution will have to be added?

Watch Video Solution

13. How may 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?

Watch Video Solution

14. IQ of a person is given by 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 year children, find the range of their mental age.

Watch Video Solution