MATHS

BOOKS - A N EXCEL PUBLICATION

LINEAR INEQUALITIES

Question Bank

1. Solve $\dfrac{5 - 2x}{3} \leq \dfrac{x}{6} - 5$. Represent the solution set graphically.

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2. In the first four examinations each of 100 marks, Hamid got 94,73,72,84 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, what range of marks on the fifth(last) examination will result in Hamid receiving "B" in the course?

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

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4. Solve $24x < 100$. When x is a natural number.

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5. Solve $24x < 100$. When x is an integer.

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6. Solve $-12x > 30$ When x is a natural number

7. Solve $-12x > 30$ When x is an integer

8. Solve $5x - 3 < 7,$ when x is an integer

9. Solve $5x - 3 < 7$, when x is a real number

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10. Solve $3x + 8 > 2$ when x is an integer

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11. Solve $3x + 8 > 2$ when x is a real number.

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12. Solve the inequality $4x + 3 < 7$ for real x.

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13. Solve $3x - 7 > 5x - 1$ for real x.

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14. Solve the inequality $3(x - 1) \leq 2(x - 3)$.

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15. Solve the inequality: $3(2 - x) \geq 2(1 - x)$.

16. Solve : $x + \dfrac{x}{2} + \dfrac{x}{3} < 11$ for real x.

17. Solve $\dfrac{x}{3} > \dfrac{x}{2} + 1$ for real x

18. Solve $\dfrac{3(x-2)}{5} \le \dfrac{5(2-x)}{3}$.

19. Solve the following inequalities.

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

20. Solve $2(2x + 3) - 10 < 6(x - 2)$ for real x

21. Solve $37 - (3x + 5) \leq 9x - 8(x - 3)$ for real x

22. Solve the inequality $\dfrac{x}{2} \geq \dfrac{5x - 2}{3} - \dfrac{7x - 3}{5}$

23. Solve the inequality $\dfrac{2x - 1}{3} \geq \dfrac{3x - 2}{4} - \dfrac{2 - x}{5}$

24. Solve the inequality $3x - 2 < 2x + 1$ and show its graph.

25. Solve $5x - 3 \geq 3x - 5$ and draw the graph of the solution set.

26. Show the solution of each inequality on a number line.

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

27. Solve $\dfrac{x}{2} < \dfrac{5x - 2}{3} - \dfrac{7x - 3}{5}$ and draw the graph of the solution set.

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

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

in the fifth examination to get grade 'A' in the course.

30. Find all pairs of consecutive odd natural numbers, both of which are smaller than 10, such that their sum is more than 11.

31. Find all pairs of consecutive even positive integers,both of which are larger than 5, such

that their sum is less than 23.

32. 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.

33. A man wants to cut three length 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.?

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34. In drilling world's deepest hole, it was found that the temperature T in degree celcius,x km

below the surface of earth was given by

$$T = 30 + 25(x - 3), 3 < x < 18$$

If the temperature is between $300°$C and $400°$C, find an inequality in x.

35. In drilling world's deepest hole, it was found that the temperature T in degree celcius, x km below the surface of earth was give by

$$T = 30 + 25(x - 3), 3 < x < 18$$

At what depth,will the temperature be between $300°$C and $400°$ C ?

36. The water acidity in a pool is considered normal when the average Ph reading of three daily measurements is between 7.1 and 7.6. If the first two Ph reading are 7.18 and 7.55 and if the third reading is x, find the range of Ph value for the third reading that result in the acidity level being normal.

37. Choose the correct answer from the bracket to fill in the blanks $4x - 2 < 2(x - 2)$

$-_-$ $-<$ $2x - 4$

38. Choose the correct answer from the bracket to fill in the blanks $4x - 2 < 2(x - 2)$

$x < \ldots\ldots\ldots . \, (-1, 2x - 4, 4x - 2, 3x - 4)$

39. Choose the correct answer from the brackets

to fill in the blanks $\dfrac{3(x-2)}{5} \leq \dfrac{5(2-x)}{3}$

$.......(x-2) \leq .... (2-x)$

$(9,\ 25,\ -9,\ -18,\ 18,\ 3x,\ x,\ 2x,\ 25x,\ 58,\ 68,\ 2)$

40. Choose the correct answer from the brackets

to fill in the blanks $\dfrac{3(x-2)}{5} \leq \dfrac{5(2-x)}{3}$

$9x - .... \leq 50 - ....$

$(9,\ 25,\ -9,\ -18,\ 18,\ 3x,\ x,\ 2x,\ 25x,\ 58,\ 68,\ 2)$

41. Choose the correct answer from the brackets

to fill in the blanks $\dfrac{3(x-2)}{5} \le \dfrac{5(2-x)}{3}$

$34x \le$ ....

$(9,\ 25,\ -9,\ -18,\ 18,\ 3x,\ x,\ 2x,\ 25x,\ 58,\ 68,\ 2)$

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42. Choose the correct answer from the brackets

to fill in the blanks $\dfrac{3(x-2)}{5} \le \dfrac{5(2-x)}{3}$

$x \le$ ....

$(9,\ 25,\ -9,\ -18,\ 18,\ 3x,\ x,\ 2x,\ 25x,\ 58,\ 68,\ 2)$

43. consider the system of inequalities

$$x + 3 > 0, 2x < 14$$

Prove that $-4 \leq x, 5x > -15$

44. Consider two consecutive odd natural numbers both of which are larger than 10, such that their sum is less than 40.

If the first odd natural numbers is x, what will be the other odd natural numbers?

45. Consider two consecutive odd natural numbers both of which are larger than 10, such that their sum is less than 40.

Derive two inequalities in x.

46. Consider two consecutive odd natural numbers both of which are larger than 10, such that their sum is less than 40.

Find all pairs of odd natural numbers having the given properties .

47. Solve the inequality $x + y < 5$ graphically.

48. Solve $2x + y \geq 6$ graphically.

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49. Solve graphically the inequality $3x + y \leq 12$.

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50. Solve graphically $y + 8 > 2x$

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51. Solve graphically $x - y \leq 2$

> ▶ Watch Video Solution

52. Solve graphically $2x - 3y > 6$

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53. Solve graphically $-3x + 2y \geq -6$

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54. Solve graphically $3y - 5x \leq 30$

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55. Solve graphically $y < -2$

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56. Solve graphically $x > -3$

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

58. Solve the following system of inequalities graphically.

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

59. Solve the following system of inequalities graphically $x + y > 4, 2x - y > 0$

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60. Solve the following system of inequalities graphically.

$2x - y > 1, x - 2y \leftarrow 1$

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

62. Solve the following system of inequalities graphically.

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

63. Solve the following system of inequalities graphically.

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

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

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65. Solve the following system of linear inequalities graphically.

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

66. Solve the following system of inequalities graphically.

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

67. Solve the following system of inequalities graphically.

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

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68. Solve the following system of linear inequalities graphically.

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

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69. Solve the following system of linear inequalities graphically

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

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70. Solve the following system of linear inequalities graphically.

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

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71. Draw the graph of x + 4y = 8

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72. Draw the graph 3x - 4y = 12

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73. Draw the graphs of x = 0 and y = 0

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74. Solve the following graphically

$$x + 4y \leq 8, \, 3x - 4y \leq 12, \, x \geq 0, \, y \geq 0$$

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75. Draw the graph of x + y = 2

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76. Draw the graph of x= 1 and y = 3

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77. Solve the following inequilities graphically

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

78. Draw the graphs of $2x + y = 12$, $x + y = 7$, $x + 2y = 10$, $x = 0$ and $y = 0$ together

79. Solve the following inequilities graphically

$$2x + y \leq 12, \ x + y \leq 7, \ x + 2y \leq 10, \ x \geq 0, \ y \geq 0$$

.

80. Draw the graph of $x + 2y \geq 16$

81. Draw the graph $2x + y \geq 14$,$x \geq 0, y \geq 0$

82. Draw the graph $x + y \geq 12$

83. Draw the graph $2x + y \geq 14$ $,x \geq 0, y \geq 0$

84. Draw the graph 13x + 2y = 20

85. Draw the graph 3x + y = 15

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86. Draw the graphs of x = 0 and y = 0

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87. Solve the following system of linear inequalities

$$3x + 2y \geq 20, 3x + y \leq 15, x \geq 0, y \geq 0$$

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88. Consider two consecutive odd natural numbers both of which are larger than 10, such that their sum is less than 40.

If the first odd natural numbers is x, what will be the other odd natural numbers?

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89. Consider two consecutive odd natural numbers both of which are larger than 10, such

that their sum is less than 40.

Derive two inequalities in x.

90. There are two consecutive odd numbers of which the smaller number is greater than 10 and their sum is less than 40

What are the possible values of x satisfying the inequaities .

91. Draw the graph of 2x + 3y = 6

92. Draw the graph x+ y = 2

93. Solve the following linear inequalities graphically

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

94. Solve the following inequalities.

$2 \leq 3x - 4 \leq 5$

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95. Solve the following inequalities.

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

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96. Solve the following inequalities.

$$-3 \leq 4 - \frac{7x}{2} \leq 18$$

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97. Solve the following inequilities.

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

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98. Solve the following inequilities.

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

99. Solve the following inequalities.

$$7 \leq \frac{3x + 11}{2} \leq 11$$

100. Solve the following inequilities and represent the solution graphically on the real line.

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

101. Solve the following inequilities and represent the solution graphically on the real line.

$$2(x - 1) < x + 5, 3(x + 2) > 2 - x$$

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102. Solve the following inequalities and represent the solution graphically on the real line.

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

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103. Solve the following inequalities and represent the solution graphically on the real line.

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

104. Asolution is to be kept between $68^{\circ} F$ and $77^{\circ} F$ What is the range in temperature in degree celcius (C) if the celcius faherenheit (F) conversion formula is given by F = 9/5C + 32

105. 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.

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

107. IQ of a person is given by the formula IQ = $\dfrac{MA}{CA} \times 100$, 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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