MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

LINEAR INEQUATIONS

Others

1. Show that the solution set of the following linear in equations is an unbounded set: $x + \mathrm{y} \geq 9, 3x + y \geq 12, x \geq 0, y \geq 0.$

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2. Solve the following inequations grapihically: $(i)|x| \leq 3$ (ii) $|y - x| \leq 3$

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3. Exhibit graphically the solution set of the linear inequations $x + \mathrm{y} \leq 5, 4x + y \geq 4, x + 5y \geq 5, x \leq 4, y \leq 3$

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4. Solve each of the following system of equations in R. $x + 5 > 2(x + 1), 2 - x < 3(x + 2),$

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5. Solve the following linear inequations: (i) $\frac{x-3}{x-5} > 0$ (ii) $\frac{x-2}{x+5} > 2$

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6. Solve: $5 \leq \frac{2-3x}{4} \leq 9$

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7. $\frac{2x-3}{4} - 2 \geq \frac{4x}{3} - 6$

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8. Solve the following linear inequations in R.

$\frac{5x}{2} + \frac{3x}{4} \geq \frac{39}{4}$

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9. Solve the following system of linear inequations:

$3x - 6 \geq 0$

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10. Solve the following linear inequations in R. $\frac{7x - 5}{8x + 3} < 4$

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11. Solve the following linear inequations in R. $\frac{5x + 8}{4 - x} < 2$

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12. A company manufactures cassettes and its cost and revenue functions for a week are $C = 300 + \frac{3}{2}x$ and $R = 2x$ respectively, where x is the number of cassettes produced and sold in a week. How many cassettes must be sold for the company to realize a profit?

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

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14. Show that the following system of linear equations in R

$5x + 4 > 2x - 1$

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15. Solve each of the following system of equations in R.

$0 < \frac{-x}{2} < 3$

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16. Solve each of the following system of inequations in R.

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

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17. Write the solution set of inequation $\left|x+\frac{1}{x}\right|>2$.

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18. Solve each of the following system of inequations in R

$\frac{2x-1}{3}=0$.

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19. Write the solution set of inequation: $(x-2)\ <0.\ x$ belongs to Natural Number.

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20. Solve each of the following system of equations in R.

$|x-1|+|x-2|+|x-3| \geq 6$

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21. Solve each of the following system of equations in R : If

$|x+1|+|x|>6$

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22. Solve each of the following system of equations in R.

$\frac{1}{|x|-3} \leq \frac{1}{2}$

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23. Solve: $|x-1|+|x-2| \geq 4$

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24. Solve: $\frac{5x-1}{x+2} < 0.$

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25. Write the solution set of inequation: $\left|\frac{1}{x-2}\right| < 4, x \neq 4.$

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26. Solve: $\frac{|x+3|+x}{x+2} > 1$

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

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

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29. Solve each of the following system of equations in R.

$1 \leq |x-2| \leq 3$

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30. Solve each of the following system of equations in R.

$1 \leq |x-2| \leq 3$

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31. Solve the following system of equations in R.

$\frac{4}{x+1} \leq 3 \leq \frac{6}{x+1}, x > 0$

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32. Solve: $|x-2| \geq 5$

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33. Solve the following linear inequations: $\frac{x-3}{x-5} > 0$

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34. Solve the following linear inequations in R.

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

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35. Solve the following linear inequations: $\frac{x-2}{x+5} > 0$

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36. Solve the following linear inequations in R.

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

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37. Solve $5x - 3 < 3x + 1$ when x is an integer

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38. Solve the following equations: $3x + 17 \leq 2(1-x) +$

$2(2x+3) - 10 \leq 6(x-2)$

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39. Solve the inequalities for real x :

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

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40. In the first four papers each of 100 marks, Rishi got 95, 72, 73, 83 marks. If he wants an average of greater than or equal to 75 marks and less than 80 marks, find the range of marks he should score in the fifth paper.

A. $52 \leq x < 77$

B. $25 < x < 75$

C. $75 < x < 80$

D. $73 < x < 100$

Answer: A

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41. Solve the following linear inequations in R.

$$\frac{5x}{2} + \frac{3x}{4} \geq \frac{39}{4}$$

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42. Solve the following linear inequations in R.

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

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43. Solve each of the following system of equations in R.

$1 \leq |x-2| \leq 3$

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44. Solve each of the following system of equations in R.

$1 \leq |x-2| \leq 3$

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45. Solve the following linear inequation: $2x - 4 \leq 0$

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46. Solve the following linear inequation: $-3x + 12 < 0$

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47. Solve the following linear inequation: $4x - 12 \geq 0$

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48. Solve the following linear inequation: $7x + 9 > 30$

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49. Solve the following inequation: $\frac{1}{x-2} < 0$

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50. Solve the following inequation: $\frac{x+1}{x+2} \geq 1$

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51. Solve the following linear inequation in R: $12x < 50,\ when\ x \in R$

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52. Solve the following linear inequation in R: $12x < 50,\ when\ x \in N$

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53. Solve the following linear inequation in R: $-4x > 30$, $when\, x \in R$

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54. Solve the following linear inequation in R: $-4x > 30$, $when\, x \in Z$

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55. Solve the following linear inequation in R: $-4x > 30$, $when\, x \in N$

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56. Solve the following linear inequation in R: $4x - 2 < 8,\ when\ x \in R$

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57. Solve the following linear inequation in R: $4x - 2 < 8,\ when\ x \in Z$

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58. Solve the following linear inequation in R: $4x - 2 < 8,\ when\ x \in N$

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59. Solve the following linear inequation in $R: 3x - 7 > x + 1$

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60. Solve the following linear inequation in $R: 2(3 - x) \geq \frac{x}{5} + 4$

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61. Solve the following linear inequation in $R: \frac{x}{5} < \frac{3x - 2}{4} - \frac{5x - 3}{5}$

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62. Solve the following linear inequation in R: $\frac{x-1}{3} \geq \frac{x-5}{5} - 2$

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63. Solve the following linear inequation in R: $\frac{4+2x}{3} \geq \frac{x}{2} - 3$

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64. Solve the following linear inequation in R: $\frac{6x-5}{4x+1} < 0$

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65. Solve the following linear inequation in R: $\frac{1}{x-1} \leq 2$

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66. Solve the following linear inequation in R: $\frac{x}{x-5} > \frac{1}{2}$

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67. Solve the following linear inequation in $R: x + 5 > 4x - 10$

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68. Solve the following linear inequation in $R: \frac{3x-2}{5} \leq \frac{4x-3}{2}$

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69. Solve the following linear inequation in R: $\frac{2x+3}{5} - 2 < \frac{3(x-2)}{5}$

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70. Solve the following linear inequation in R: $\frac{2x-3}{3x-7} > 0$

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71. Solve the following linear inequation in R: $\frac{x-1}{x+3} > 2$

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72. Solve the following linear inequation in $R: 3x + 9 \geq -x + 19$

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73. Solve the following linear inequation in $R: -(x-3) + 4 < 5 - 2x$

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74. Solve the following linear inequation in $R: \frac{5-2x}{3} < \frac{x}{6} - 5$

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75. Solve the following linear inequation in $R: x - 2 \leq \frac{5x + 8}{3}$

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76. Solve the following linear inequation in $R: \frac{3}{x - 2} < 1$

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77. Solve the following linear inequation in $R: \frac{5x - 6}{x + 6} < 1$

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78. Solve $-11 \leq 4x - 3 \leq 13$

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79. Solve each of the following system of equation in $R: x+3>0,\ 2x<14$

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80. Solve each of the following system of equation in $R: 3x-6>0,\ 2x-5>0$

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81. Solve each of the following system of equation in $R: 3x-1\geq 5,\ x+2\succ 1$

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82. Solve each of the following system of equation in $R: 2(x-6) < 3x-7,\ 11-2x < 6-x$

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83. Solve each of the following system of equation in $R: \frac{2x+1}{7x-1} > 5, \frac{x+7}{x-8} > 2$

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84. Solve each of the following system of equation in $R: 10 \leq -5(x-2) < 20$

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85. Solve each of the following system of equation in $R: 2x - 7 > 5 - x,\ 11 - 5x \leq 1$

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86. Solve each of the following system of equation in $R: 2x + 6 \geq 0,\ 4x - 7 < 0$

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87. Solve each of the following system of equation in $R: 2x - 3 < 7, 2x > 4$

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88. Solve each of the following system of equation in $R: 5x - 1 < 24, 5x + 1 > 24$

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89. Solve each of the following system of equation in $R: 11 - 5x \succ 4,\ 4x + 13 \leq -11$

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90. Solve each of the following system of equation in $R: 5x - 7 > 3(x + 3),\ 1 - \frac{3x}{2} \geq x - 4$

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91. Solve each of the following system of equation in $R: \frac{7x-1}{2} < -3, \frac{3x+8}{5} + 11 < 0$

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92. Solve each of the following system of equation in $R: -5 < 2x - 3 < 5$

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93. Solve the inequation for x; if $|3x-2| \leq \frac{1}{2}$

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94. Solve each of the following system of equation in $R: \left|x+\frac{1}{3}\right|>\frac{8}{3}$

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95. Solve each of the following system of equation in $R: \left|\frac{3x-4}{2}\right| \leq \frac{5}{12}$

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96. Solve each of the following system of equation in $R: \frac{1}{|x|-3}<\frac{1}{2}$

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97. Solve each of the following system of equation in $R: \left|\frac{2x-1}{x-1}\right| > 2$

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98. Solve each of the following system of equation in $R: |4-x|+1 < 3$

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99. Solve each of the following system of equation in $R: \frac{|x-2|}{x-2} > 0$

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100. Solve each of the following system of equation in $R: \frac{|x+2|}{x} < 2$

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101. Find all pairs of consecutive odd positive integers, both of which are smaller than 18, such that their sum is more than 20.

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102. Find all pairs of consecutive even positive integers, both of which are larger than 8, such that their sum is less than 25.

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103. The cost and revenue functions of a product are given by $C(x) = 2x + 400\ and\ R(x) = 6x + 20$ respectively, where x is the number of items produced by the manufacturer. How many items the manufacturer must sell to realize some profit?

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104. 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.

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105. Find all pairs of consecutive add positive integers both of which are smaller than 10 such that their sum is more than 11,

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106. Find all pairs of consecutive odd natural number, both of which are larger than 10, such that their sum is less than 40.

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107. 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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108. The marks scored by Rohit in two tests were 65 and 70. Find the minimum marks he should score in the third test to have an average of at least 65 marks.

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109. A solution is to be kept between 30^0C *and* 35^0C . What is the range of temperature in degree Fahrenheit?

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110. To receive grade A in a cource, one must obtain an average of 90 marks or more in five papers each of 100 marks. If Shikha scored 87, 95, 92 and 94 marks in first four papers find the minimum marks that she must score in the last paper to get grade A in the course.

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111. 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.

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112. 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?

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113. 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 640 litres of the 8% solution, how many litres of 2% solution will have to be added?

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114. 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.

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115. Solve the following inequation graphically: $2x + 3y \leq 6$

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116. Solve the following inequation graphically: $2x - y \geq 1$

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117. Solve the following inequation graphically: $x \geq 2$

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118. Solve the following inequation graphically: $y \leq -3$

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119. Represent to solution set of each of the following inequation graphically in two dimensional plane: $x + 2y - y \leq 0$

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120. Represent to solution set of each of the following inequation graphically in two dimensional plane: $x - 2y < 0$

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121. Represent to solution set of each of the following inequation graphically in two dimensional plane: $0 \leq 2x - 5y + 10$

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122. Represent to solution set of each of the following inequation graphically in two dimensional plane: $3x - 2y \leq x + y - 8$

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123. Represent to solution set of each of the following inequation graphically in two dimensional plane: $x + 2y \geq 6$

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124. Represent to solution set of each of the following inequation graphically in two dimensional plane: $-3x + 2y \leq 6$

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125. Represent to solution set of each of the following inequation graphically in two dimensional plane: $3y > 6 - 2x$

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126. Represent to solution set of each of the following inequation graphically in two dimensional plane: $x + 2 \geq 0$

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127. Represent to solution set of each of the following inequation graphically in two dimensional plane: $x \leq 8 - 4y$

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128. Represent to solution set of each of the following inequation graphically in two dimensional plane: $y > 2x - 8$

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129. Draw the diagram f the solution set of the linear inequations $3x + 4y \geq 12,\ y \geq 1,\ x \geq 0.$

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130. Find the linear equations for which the shaded area in Fig: 15.39 is the solution set.

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131. Find the linear inequations for which the shaded region in fig. 15.40 is the solution set.

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132. solve the following system of inequation by graphical method:

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

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133. Solve the following system of linear inequation graphically:

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

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134. Solve the following system of linear inequation graphically:

$x + y \geq 1,\ 7x + 9y \leq 63,\ x \leq 6,\ y \leq 5,\ x \geq 0,\ y \geq 0$

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135. Solve the following system of linear inequation graphically: $2x + 3y \leq 35,\ y \geq 3,\ x \geq 2,\ x \geq 0,\ y \geq 0$

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136. Solve the following system of linear inequation graphically: $2x+y\geq 4, x+y\leq 3, 2x-3y\leq 6$

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137. Show that the solution set of the following linear inequations is empty set:

$x-2y\geq 0,\ 2x-y\leq -2,\ x\geq 0,\ y\geq 0$

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138. Show that the solution set of the following linear inequations is empty set:

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

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139. Find the linear inequations for which the shaded area in fig. 15.41 is the solution set. Draw the diagram of the solution set of the linear inequations.

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140. Find the linear inequations for which the solution set is the shaded region given in fig. 15.42.

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141. Solve the following systems of inequation graphically:

$2x + y \geq 8,\ x + 2y \geq 8,\ x + y \leq 6$

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142. Solve the following systems of inequation graphically:

$12x + 12y \leq 840,\ 3x + 6y \leq 300,\ 8x + 4y \leq 480\ x \geq 0,\ y \geq 0$

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143. Solve the following systems of inequation graphically:

$x + 2y \leq 40,\ 3x + y \geq 30,\ 4x + 3y \geq 60,\ x \geq 0,\ y \geq 0$

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144. Solve the following systems of inequation graphically:

$5x + y \geq 10,\ 2x + 2y \geq 12,\ x + 4y \geq 12,\ x \geq 0,\ y \geq 0$

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145. Show that the solution set of the following system of linear inequalities in an unbounded region $2x + y \geq 8,\ x + 2y \geq 10,\ x \geq 0,\ y \geq 0.$

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146. Write the following set of the inequation $\frac{x^2}{x-2} > 0.$

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147. Write the solution set of the inequation $x + \frac{1}{x} \geq 2.$

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148. Write the solution set of the equation $|2 - x| = x - 2$.

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149. Writhe the set of values of x satisfying $|x - 1| \leq 3 \, and \, |x - 1| \leq 1$.

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150. The number of integral solutions of $\frac{x + 2}{x^2 + 1} > \frac{1}{2}$ is (A) 4 (B) 5 (C) 3 (D) 2 (E) 6

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151. Write the solution set of the inequation $|x-1| \geq |x-3|$.

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152. If $x < 7$ then $a.\ -x < -7$ b. $-x \leq 7$ c. $-x \succ 7$ d. $-x \geq -7$

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153. If $-3x + 17 < -13,\ then\ x \in (10, \infty)$ b. $x \in [10, \infty)$ c. $x \in (-\infty, 10]$ d. $x \in [-10, 10)$

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154. Given that $x, y \, and \, b$ are real numbers and $x > y, b > 0$ then `x/b y/b$d$. x/b>=y/b`

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155. If x is a real number and $|x| < 5,$ then X

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156. If $x \, and \, a$ are real numbers such that $a > 0$ and $|x| > a,$ then (a) $x \in (-a, \infty)$ b. $x \in [-\infty, a)$ c. $x \in (-a, a)$ d . $x \in (-\infty, -a) U (a, \infty)$

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157. If $|x-1|>5$, then a. $x \in (-4,6)$ b. $x \in [-4,6]$ c. $x \in (-\infty,-4) \cup (6,\infty)$ d. $x \in (-\infty,-4) \cup [6,\infty)$

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158. If $|x+2| \leq 9$, then

A. $x \in (-7,11)$

B. $x \in [-11,7]$

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

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

Answer: B

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159. Represent the graph of following inequality $|x| \leq 3$

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160. The linear inequality $|x| \leq 5$ of which write the solution set and draw graph.

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161. The solution set of the inequation $|x+2| \leq 5$ is $(-7, 5)$

b. $[-7, 3]$ c. $[-5, 5]$ d. $(-7, 3)$

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162. If $|x+3| \geq 10$, then $x \in (-13, 7]$ b. $x \in (-\infty, -13) \cup (7, \infty)$ c. $x \in (-13, 7)$ d. $x \in (-\infty, -13] \cup [7, \infty)$

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163. If $\frac{|x-2|}{x-2} \geq 0$, then

A. $x \in [2, \infty)$

B. $x \in (2, \infty)$

C. $x \in (-\infty, 2)$

D. $x \in (-\infty, 2]$

Answer: B

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