MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

LINEAR EQUATION IN ONE VARIABLE

Others

1.

$Solve: 3x + 7 = 12, \frac{5}{2}x - 9 = 1\ and\ \frac{x}{3} + 5 = \frac{x}{2} - 3$

are equations in one variable x.

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2. $Solve: 2x + 3y = 15, 7x - \frac{y}{3} = 3$ are equations in two variables x and y.

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3. $3x - 2 - 7, \frac{3}{2}x + 9 = \frac{1}{2}, \frac{y}{3} + \frac{y-2}{4} = 5$ are linear equations in one variable, because the highest power of the variable in each equation in one whereas the equations $3x^2 - 2x + 1 = 0, y^2 - 1 = 8$ are not linear equations, because the highest power of the variable in each equation is not one. In this chapter, we shall study linear equations in one variable only.

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4. Verify that $x = 4$ is a root of the equation $2x - 3 = 5$

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5. Verify that $x = 8$ is a solution of the equation $\frac{5x - 4}{8} - \frac{x - 3}{5} = \frac{x + 6}{5}$

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6. Verify that $x = 4$ is a root of the equation $2x - 3 = 5$.

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7. Solve the equation: $\frac{x}{5} + 11 = \frac{1}{15}$ and check the result.

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8. Solve: $\frac{1}{3}x - \frac{5}{2} = 6$

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9. Solve: $\frac{x}{2} - \frac{x}{3} = 8$

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10. Solve: $\frac{x}{2} + \frac{x}{3} - \frac{x}{4} = 7$

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11. Solve: $\frac{y-1}{3} - \frac{y-2}{4} = 1$

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12. Solve each of the following equations and also verify your solution: $9\frac{1}{4} = y - 1\frac{1}{3}$ (2) $\frac{5x}{3} + \frac{2}{5} = 1$

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13. Solve each of the following equations and also verify your solution: $\frac{x}{2} + \frac{x}{3} + \frac{x}{4} = 13$ (2) $\frac{x}{2} + \frac{x}{8} = \frac{1}{8}$

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14. Solve each of the following equations and also verify your solution:

(i) $\frac{2x}{3} - \frac{3x}{8} = \frac{7}{12}$

$(ii)(x+2)(x+3) + (x-3)(x-2) - 2x(x+1) = 0$

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15. Solve each of the following equations and also verify your solution:

(i) $\frac{x}{2} - \frac{4}{5} + \frac{x}{5} + \frac{3x}{10} = \frac{1}{5}$

(2) $\frac{7}{x} + 35 = \frac{1}{10}$

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16. Solve each of the following equations and also verify your solution:

$(i)\frac{2x-1}{3}-\frac{6x-2}{5}=\frac{1}{3}$

$(ii)13(y-4)-3(y-9)-5(y+4)=0$

$(iii)\frac{2}{3}(x-5)-\frac{1}{4}(x-2)=\frac{9}{2}$

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17. Let L be the line of intersection of the planes $2x+3y+z=1$ and $x+3y+2z=2$. If L makes an angles α with the positive x-axis, then $\cos\alpha$ equals

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18. Solve the linear equations.

$x+7 - \frac{8x}{3} = \frac{17}{6} - \frac{5x}{8}$

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19. Solve : $\frac{3t-2}{4} - \frac{2t+3}{3} = \frac{2}{3} - t$

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20. Solve: $\frac{x+2}{6} - \left(\frac{11-x}{3} - \frac{1}{4}\right) = \frac{3x-4}{12}$

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21. Solve : $x - \frac{2x+8}{3} = \frac{1}{4}\left(x - \frac{2-x}{6}\right) - 3$

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22. Solve: $0.16(5x-2) = 0.4x + 7$

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23. Solve: $\frac{2}{5x} - \frac{5}{3x} = \frac{1}{15}$

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24. Solve: $\frac{17-3x}{5} - \frac{4x+2}{3} = 5 - 6x + \frac{7x+14}{3}$

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25. Solve: $\frac{x+2}{3} - \frac{x+1}{5} = \frac{x-3}{4} - 1$

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26. Solve:

$(2x+3)^2 + (2x-3)^2 = (8x+6)(x-1) + 22$

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27. Solve each of the following equations and also check your result in each case: $\frac{2x+5}{3} = 3x - 10$ (2)

$\frac{a-8}{3}=\frac{a-3}{2}$ (3) $\frac{7y+2}{5}=\frac{6y-5}{11}$ (4)

$x-2x+2-\frac{16}{3}x+5=3-\frac{7}{2}x$

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28. Solve each of the following equations and also check your result in each case: 1) $\frac{1}{2}x+7x-6=7x+\frac{1}{4}$ 2) $\frac{3}{4}x+4x=\frac{7}{8}+6x-6$ 3) $\frac{7}{2}x-\frac{5}{2}x=\frac{20}{3}x+10$ (4) $\frac{6x+1}{2}+1=\frac{7x-3}{3}$

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29. Solve each of the following equations and also check your result in each case: $\frac{3a-2}{3}+\frac{2a+3}{2}=a+\frac{7}{6}$ (2) $x-\frac{(x-1)}{2}=1-\frac{(x-2)}{3}$

$$(3)\frac{x}{4}-\frac{(x-1)}{2}=\frac{(x-2)}{3} \quad (4)$$
$$\frac{5x}{3}-\frac{(x-1)}{4}=\frac{(x-3)}{5}$$

A. Solve each of the following equations and also check your result in each case:

$$(1)\frac{3a-2}{3}+\frac{2a+3}{2}=a+\frac{7}{6} \quad (2)$$
$$x-\frac{(x-1)}{2}=1-\frac{(x-2)}{3}$$
$$(3)\frac{x}{4}-\frac{(x-1)}{2}=\frac{(x-2)}{3} \quad (4)$$
$$\frac{5x}{3}-\frac{(x-1)}{4}=\frac{(x-3)}{5}$$

B. null

C. null

D. null

Answer: null

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30. Solve the following equations and also check your result in each case:

$(i)\frac{(3x+1)}{16}+\frac{(2x-3)}{7}=\frac{(x+3)}{8}+\frac{(3x-1)}{14}$

$(ii)\frac{(1-2x)}{7}-\frac{(2-3x)}{8}=\frac{3}{2}+\frac{x}{4}$

$(iii)\frac{9x+7}{2}-\left(x-\frac{x-2}{7}\right)=36$

$(iv)0.18\,(5x-4)=0.5x+0.8$

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31. Solve each of the following equations and also check your result in each case: (i)$\frac{2}{3x}-\frac{3}{2x}=\frac{1}{12}$ (ii) $\frac{4x}{9}+\frac{1}{3}+\frac{13}{108}x=\frac{8x+19}{18}$

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32. Solve each of the following equations and also check your result in each case:

$$\frac{(45-2x)}{15}-\frac{(4x+10)}{5}=\frac{(15-14x)}{9}$$

$$5\left(\frac{7x+5}{3}\right)-\frac{23}{3}=13-\frac{4x-2}{3}$$

$$\frac{7x-1}{4}-\frac{1}{3}\left(2x-\frac{1-x}{2}\right)=\frac{10}{3}$$

$$\frac{0.5(x-0.4)}{0.42}-\frac{0.6(x-2.71)}{0.42}=x+6.1$$

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33. Solve each of the following equations and also check your result in each case:

$$6.5x+\frac{19.5x-32.5}{2}=6.5x+13+\left(\frac{13x-26}{2}\right)$$

$(3x-8)(3x+2)-(4x-11)(2x+1)=(x-3)x+7)$

$[(2x+3)+(x+5)]^2+[(2x+3)-(x+5)]^2=10x^2+92$

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34. Solve : $\frac{2x+1}{3x-2}=\frac{9}{10}$

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35. Solve: $\frac{3x+5}{2x+7}=4$

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36. Solve : $\frac{17(2-x)-5(x+12)}{1-7x}=8$

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37. Solve: $\frac{x+b}{a-b} = \frac{x-b}{a+b}$

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38. Solve: $\frac{(4+x)(5-x)}{(2+x)(7-x)} = 1$

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39. Solve: $\frac{1}{x+1} + \frac{1}{x+2} = \frac{2}{x+10}$

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40. Solve: $\frac{6x^2 + 13x - 4}{2x + 5} = \frac{12x^2 + 5x - 2}{4x + 3}$

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41. Solve: $\frac{4x + 17}{18} - \frac{13x - 2}{17x - 32} + \frac{x}{3} = \frac{7x}{12} - \frac{x + 16}{36}$

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42. Solve the equation and verify your answer: $\frac{2x - 3}{3x + 2} = -\frac{2}{3}$

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43. Solve the equation and verify your answer:

$$\frac{2-y}{y+7}=\frac{3}{5}$$

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44. Solve the equation and verify your answer:

$$\frac{5x-7}{3x}=2$$

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45. Solve the equation and verify your answer:

$$\frac{3x+5}{2x+7}=\frac{5}{8}$$

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46. Solve the equation and verify your answer:

$$\frac{2y+5}{y+4}=1$$

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47. Solve the equation and verify your answer:

$$\frac{2x+1}{3x-2}=\frac{5}{9}$$

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48. Solve the equation and verify your answer:

$$\frac{1-9y}{19-3y}=\frac{5}{8}$$

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49. Solve the equation and verify your answer:

$$\frac{2x}{3x+1} = -3$$

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50. Solve the equation and verify your answer:

$$\frac{y-(7-8y)}{9y-(3+4y)} = \frac{2}{3}$$

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51. Solve the equation and verify your answer:

$$\frac{6}{2x-(3-4x)} = \frac{2}{3}$$

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52. Solve the equation and verify your answer:

$$\frac{2}{3x} - \frac{3}{2x} = \frac{1}{12}$$

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53. Solve the equation and verify your answer:

$$\frac{3x+5}{4x+2} = \frac{3x+4}{4x+7}$$

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54. Solve the equation and verify your answer:

$$\frac{7x-2}{5x-1} = \frac{3x-4}{x+6}$$

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55. Solve the equation and verify your answer:

$$\frac{x+2}{x+5} = \frac{x}{x+6}$$

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56. Solve the equation and verify your answer:

$$\frac{2x-(7-5x)}{9x-(3+4x)} = \frac{7}{6}$$

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57. Solve the equation and verify your answer:

$$\frac{15(2-x)-5(x+6)}{1-3x} = 10$$

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58. Solve the equation and verify your answer:

$$\frac{x+3}{x-3}+\frac{x+2}{x-2}=2$$

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59. Solve the equation and verify your answer:

$$\frac{(2x+3)-(5x-7)}{6x+11}=-\frac{8}{3}$$

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60. Find the positive value of x for which the given equation is satisfied: $\frac{x^2-9}{5+x^2}=-\frac{5}{9}$ (ii) $\frac{y^2+4}{3y^2+7}=\frac{1}{2}$

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61. A number is such that it is as much greater than 84 as it is less than 108. Find the number.

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62. A number is 56 greater than the average of its third, quarter and one twelfth. find it .

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63. A number consists of two digits whose sum is 8 if 18 is added to the number its digits are reversed find the number

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64. Divide 34 in to two parts in such a way that $\left(\frac{4}{7}\right)^{th}$ of one part is equal to $\left(\frac{2}{5}\right)^{th}$ of the other

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65. The numerator of a fraction is 4 less than denominator. If 1 is added to both its numerator and denominator, it becomes $\frac{1}{2}$. Find the fraction.

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66. Saurabh has Rs 34 fifty paise and twenty-five paise coins. If the number of 25 paise coins be twice the number of 50 paise coins, how many coins of each type does he have:?

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67. Arvind has a piggy bank . It is full of one-rupee and fifty-paise coins. It contains 3 times as many fifty paise coins as one rupee coins. The total amount of the money in the bank is Rs 35. How many coins of each kind are there in the bank:

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68. Kanwar is three years older anima. six years ago kanwar was four times animas age find the ages of kanwar and anima.

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69. After 12 years I shall be 3 times as old as I was 4 years ago. Find my present age.

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70. My age is four times the difference of my age after four years and my age three years back. How old I am?

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71. Hamid has three boxes of different fruits. Box A weighs $2\frac{1}{2}$ kg more than box b and box c weighs $10\frac{1}{4}$ kg more than box B. The total weight of the boxes is 48 $\frac{3}{4}$ How many kg does box A weigh?

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72. There are 90 multiple choice questions in a test. Suppose you get two marks for every correct answer and for every question you leaver unattempted or answer wrongly, one mark is deducted from your total score of correct answers. If you get 60 marks in the test, then how may questions did you answer correctly?

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73. A man sold an article for Rs 490 and gained 10% on it. Find the cost price of the article.

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74. How much pure alcohol be added to 400 ml of a 15% solution to make its strength 32%?

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75. 50 kg of an alloy of lead and tin contains 60% lead. How much lead must be melted into it to make an alloy

containing 70% lead?

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76. The sum of two numbers is 2490. If 6.5% of one number is equal to 8.5% of the other,find the numbers.

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77. The sum of two numbers is 45 and their ratio is 7:8 . Find the numbers.

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78. Two numbers are such that the ratio between them is 3:5. If each is increased by 10, the ratio between the new numbers so formed is 5:7. Find the original numbers.

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79. Three prizes are to be distributed in a quiz contest. The value of the second prize is five sixths the value of the first prize and the value of the third prize is four-fifths that of the second prize. If the total value of three prizes is Rs 150, find the value of each prize.

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80. Divide Rs 1380 among Ahmed, john and Babita so that the amount Ahmed receives is 5 times as much as Babita's share and is 3 times as much as john's share.

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81. The length of a rectangle exceeds its breadth by 4 cm. If length and breadth are each increased by 3 cm, the area of the new rectangle will be 81 cm^2 more than that of the given rectangle. Find the length and breadth of the given rectangle.

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82. An altitutde of a triangle is five –thirds the length of its corresponding base. If the altitude were increased by 4 cm and the base be decreased by 2 cm, the area of the triangle would remain the same. Find the base and the altitude of the triangle.

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83. Four-fifth of a number is more than three-fourth of the number by 4. Find the number

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84. The difference between the squares of two consecutive numbers is 31. Find the numbers.

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85. Find a number whose double is 45 greater than its half.

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86. Find a number such that when 5 is subtracted from 5 times the number, the result is 4 more than twice the number.

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87. A number whose fifth part increased by 5 is equal to its fourth part diminished by 5. Find the number.

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88. The sum of the digits of a two-digit number is 9. If 27 is subtracted from the number, the digits get reversed. Find the number.

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89. Divide 184 into two parts such that one-third of one part may exceed one-seventh of the other part by 8.

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90. The numerator of a fraction is 6 less then the denominator. If 3 is added to the numerator, the fraction is equal to $\frac{2}{3}$. What is the original fraction equal to ?

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91. A sum of rs 800 is in the form of denomination of rs 10 and rs 20.If the total number of notes are 50, find the number of notes of each type.

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92. Seeta has Rs 9 in fifty –paise and twenty five-paise coins. She has twice as many twenty=five paise coins as the she has fifty-paise coins. How coins of each kind does she have?

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93. Sunita is twice as old as Ashima. If six years is subtracted from Ashima's and four years added to Sunita's age, then Sunita wil be four times Ashima's age. How old were they two years ago?

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94. The ages of Sonal and Manoj are in the ratio $7:5$. Ten years hence the ratio of their ages will be $9:7$. Find their present ages

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95. Five years ago a man was seven times as old as his son. Five years hence, the father will be three times as old as his son. Find their present ages.

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96. I am currently 5 times as old as my son. In 6 years time I will be three times as old as he will be then . What are

our ages now?

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97. I have Rs 1000 in ten and five rupee notes. If the number of ten rupee notes that I have is ten more than the number of five rupee notes, how many notes do I have in each denomination?

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98. At a party, colas, squash and fruit juice were offered to guests. A fourth of the guests drank colas, a third drank squash, two fifths drank fruit juice and just three did not drink any thing. How many guests were in all?

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99. There are 180 multiple choice questions in a test. If a candidate gets 4 marks for every correct answer and for every unattempted or wrongly answered question one mark is deducted from the total score of correct answers. If a candidate scored 450 marks in the test, how many questions did he answer correctly?

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100. There are 180 multiple choice questions in a test . If a candidate gets 4 marks for every correct answer and for every unattempt or wrongly answered questions 1 mark is

deducted from the total score of correct answers. If a candidate scored 450 marks in test how many questions did he answer correctly

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101. A labourer is engaged for 20 days on the condition that he will receive Rs 60 for each day, he works and he will be fined Rs 5 for each day, he is absent. If he receives Rs 745 in all, for how many days he remained absent?

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102. Revish has three boxes whose total weight is $60\frac{1}{2}kg$. Box B weighs $3\frac{1}{2}$ kg more than box A and box C weighs

$5\frac{1}{3}\ kg$ more than box B. Find the weight of box A.

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103. The numerator of a rational number is 3 less than the denominator. If the denominator is increased by 5 and the numerator by 2, we get the rational number 1/2. Find the rational number.

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104. In a fraction, twice the numerator is 2 more than the denominator. If 3 is added to the numerator and to the denominator, the new fraction is $\frac{2}{3}$. Find the original fraction.

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105. The distance between two stations is 340 km. Two trains start simultaneously from these stations on parallel tracks to cross each other. The speed of one of them is greater than that of the other by 5 km/hr. If the distance between the two trains after 2 hours of their start is 30 km, find the speed of each train.

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106. A steamer goes downstream from one point to another in 9 hours. He covers the same distance upstream in 10 hours. If the speed of the stream be 1 km/hr, find the

speed of the steamer in still water and the distance between the ports.

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107. Bhagwanti inherited Rs 12000.00. She invested part of it as 10% and the rest at 12%. Her annual income from these investments is Rs 1280.00. How much did she invest at each rate?

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108. The length of a rectangle exceeds its breadth by 9 cm. If length and breadth are each increased by 3 cm. the area of the new rectangle will be 84 cm^2 more than that of the

given rectangle. Find the length and breadth of the given rectangle.

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109. The sum of ages of Anup and his father is 100. When Anup is as old as his father now, he will be five times as old as his son Anuj is now. Anuj will be eight years older than Anup is now, when Anup is as old as his father. What are their ages now?

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110. A lady went shopping and spent half of what she had on buying hankies and give a rupee to a beggar waiting

outside the shop. She spent half of what was left on a lunch and followed that up with a two rupes tip. She spent half of the remaining amount on a book and three rupees on bus fare. When she reached home, she found that she had exactly one rupee left. How much money did she start with?

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