MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

QUADRATIC EQUATIONS

Others

1. If the roots of the equation $ax^2 + 2bx + c = 0$ and $bx^2 - 2\sqrt{ac}x + b = 0$ are simultaneously real, then prove that $b^2 = ac$

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2. If p, q are real $p \neq q,$ then show that the roots of the equation $(p-q)x^2 + 5(p+q)x - 2(p-q) = 0$ are real and unequal.

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3. If -5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $p(x^2 + x) + k = 0$ has equal roots, find the value of k.

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4. For what value of $k, (4-k)x^2 + (2k+4)x + (8k+1) = 0$ is a perfect

square.

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5. Prove that the equation $x^2\left(a^2+b^2\right)+2x(ac+bd)+\left(c^2+d^2\right)=0$ has no real root, if $ad \neq bc$.

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6. Find the value of k for which the quadratic equation $(k+4)x^2+(k+1)x+1=0$ has equal roots

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7. If the roots of the equation $(b-c)x^2+(c-a)x+(a-b)=0$ are equal, then prove that $2b=a+c$.

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8. If the roots of the equation $\left(a^2+b^2\right)x^2-2(ac+bd)x+\left(c^2+d^2\right)=0$ are equal, prove that $\frac{a}{b}=\frac{c}{d}$

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9. Find the least positive value of k for which the equation $x^2+kx+4=0$ has real roots.

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10. Find the values of k for which the given quadratic equation has real and distinct roots:

$(i)\ kx^2 + 2x + 1 = 0$

$(ii)\ kx^2 + 6x + 1 = 0$

$(iii)\ x^2 - kx + 9 = 0$ `

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11. If 1 is a root of the quadratic equation $3x^2 + ax - 2 = 0$ and the quadratic equation $a(x^2 + 6x) - b = 0$ has equal roots, find the value of b.

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12. If 2 is a root of the quadratic equation $3x^2 + px - 8 = 0$ and the quadratic equation $4x^2 - 2px + k = 0$ has equal roots, find the value of k.

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13. Show that the equation $2(a^2 + b^2)x^2 + 2(a + b)x + 1 = 0$ has no real roots, when $a \neq b$.

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14. If the roots of the equation $(c^2 - ab)x^2 - 2(a^2 - bc)x + b^2 - ac = 0$ are equal, prove that either $a = 0$ or $a^3 + b^3 + c^3 = 3abc$.

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15. If $a, b, c,$ are real number such that $ac \neq 0,$ then show that at least one of the equations $ax^2 + bx + c = 0$ and $-ax^2 + bx + c = 0$ has real roots.

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16. Show that the roots of the equation: (x-a) (x -b) +(x- b) (x-c)+ (x- c) (x -a) =0 are always real and these cannot be equal unless a=b=c

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17. find the values of k so, that the equation $(3k+1)x^2+2(k+1)x+1=0$ has equal roots . also find the roots in each case.

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18. If the equation $\left(1+m^2\right)x^2+2mcx+\left(c^2-a^2\right)=0$ has equal roots, prove that $c^2=a^2\left(1+m^2\right)$.

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19. If -5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $p(x^2 + x) + k = 0$ has equal roots, find the value of k.

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20. Find the values of p for whch the equadratic equation $(2p + 1)x^2 - (7p + 2)x + (7p - 3) = 0$has equal roots

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21. If $ax^2 + bx + c = 0$ has equal roots, then $c =$

(a) $\frac{b}{2a}$ (b) $\frac{b}{2a}$ (c) $\frac{-b^2}{4a}$ (d) $\frac{b^2}{4a}$

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22. The positive value of k for which the equation $x^2 + kx + 64 = 0$ and $x^2 - 8x + k = 0$ will both have real roots, is (a) 4 (b) 8 (c) 12 (d) 16

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23. The value of $\sqrt{6 + \sqrt{6 + \sqrt{6 + }}}$ .....is

(a) 4

(b) 3

(c) -2

(d) 3.5

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24. If the equation $\left(a^2+b^2\right)x^2-2(ac+bd)x+c^2+d^2=0$ has equal roots, then

(a)$ab=cd$ (b) $ad=bc$ (c) $ad=\sqrt{bc}$ (d)$ab=\sqrt{cd}$

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25. A pole has to be erected at a point on the boundary of a circular park of diameter 13 metres in such a way that the difference of its distances from two diametrically

opposite fixed gates A and B on the boundary is 7 metres. Is it the possible to do so? If yes, at what distances from the two gates should the pole be erected?

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26. If $1+\sqrt{2}$ is a root of a quadratic equation with rational coefficients, write its other root.

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27. Write the sum of real roots of the equation $x^2+|x|-6=0$

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28. If the equation $x^2 - ax + 1 = 0$ has two distinct roots, then

(a)$|a| = 2$ (b) $|a| < 2$ (c) $|a| > 2$ (d)None of these

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29. If one root of the equation $2x^2 + bx + c = 0$ is three times the other, then $b^2 : ac =$

(a)$3 : 1$ (b) 3:16 (c) 16:3 (d) 16:1

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30. If one root of the equation $4x^2 - 2x + (\lambda - 4) = 0$ be the reciprocal of the other, then $\lambda =$

(a) 8 (b) -8 (c) 4 (d) -4

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31. One fourth of a herd of camels was seen in the forest. Twice the square root of the herd had gone to mountains and the remaining 15 camels were seen on the bank of a river. Find the total number of camels.

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32. Out of a group of swans $\frac{7}{2}$ times the square root of the number are playing on the shore of a tank. The two remaining ones are playing, with amorous fight, in the water. What is the total number of swans?

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33. The difference of the squares of two numbers is 45. The square of the smaller number is 4 times the larger number. Determine the numbers.

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34. If the sum of first n even natural numbers is 420, find the value of n.

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35. If 1 is the root of equation $3x^2 + ax - 2 = 0$ and the quadratic equation $a\left(x^2 + 6x\right) - b = 0$ has equal roots. Find the value of b.

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36. The sum of the squares of three consecutive natural numbers is 149. Find the numbers.

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37. The sum of two numbers is 9. The sum of their reciprocals is ½. Find the numbers.

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38. A two digit number is such that the product of its digits is 18. When 63 is subtracted from the number, the digits interchange their places. Find the number.

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39. The denominator of a fraction is one more than twice the numerator. If the sum of the fraction and its reciprocal is $2\frac{16}{21}$, find the fraction.

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40. A two digit number is four times the sum and three times the product of its digits.

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41. To fill swimming pool two pipes are to be used. If the pipe of larger diameter is used for 4 hours and the pipe of smaller diameter for 9 hours, only half the pool can be filled. Find, how long it would take for each pipe to fill the pool separately, if the pipe of smaller diameter takes 10 hours more than the pipe of larger diameter to fill the pool

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42. Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of larger diameter takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.

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43. A shop keeper buys a number of books for Rs.80. If he had bought 4 more books for the same amount, each book would have cost his Rs.1 less .How many books did he buy?

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44. An electric cable costs Rs. 200. If the cable was 3m longer and each meter of cable cost Rs 2 less, the cost of the cable would remain unchanged. Represent the above situation in the form of quadratic equation.

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45. A factory kept increasing its output by the same percentage every year. Find the percentage if it is known that the output is doubled in the last two years.

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46. If the price of a book is reduced by Rs. 5, a person can buy 5 more books for Rs. 300. Find the original list price of the book.

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47. One fourth of a herd of camels was seen in the forest. Twice the square root of the herd had gone to mountains and the remaining 15 camels were seen on the bank of a river. Find the total number of camels.

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48. The angry Arjun carried some arrows for fighting with Bheeshm. With half the arrows, he cut down the arrows thrown by Bheeshm on him and with six other arrows he killed the rath driver of Bheeshm. With one arrow each he knocked down respectively the rath, flag and the bow of Bheeshm. Finally, with one more than four times the square root of arrows he laid Bheeshm unconscious on an arrow bed. Find the total number of arrows Arjun had.

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49. Rs. 9000 were divided equally among a certain number of persons. Had there been 20 more persons, each would have got Rs. 160 less. Find the original number of persons.

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50. A peacock is sitting on the top of a pillar, which is 9m high. From a point 27m away from the bottom of the pillar, a snake is coming to its hole at the base of the pillar. Seeing the snake the peacock pounces on it. If their speeds are equal, at what distance from the whole is the snake caught?

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51. The difference of two numbers is 4.If the difference of their reciprocals is 4/21, find the numbers

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52. The sum of a number and its positive square root is 6/25.Find the number.

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53. If a integer is added to its square, the sum is 90. Find the integer with the help of quadratic equation.

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54. Two squares have sides xcm and $(x+4)$. The sum of their areas is $656cm^2$. Find the sides of the squares.

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55. Two number differ by 4 and their product is 192. Find the number.

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56. Two numbers differ by 3 and their product is 504. Find the number.

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57. The sum of two numbers is 16. The sum of their reciprocals is 1/3. Find the numbers.

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58. The sum of the squares of three consecutive natural numbers is 149. Find the numbers.

59. The sum of two numbers is 18. The sum of their reciprocals is ¼. Find the numbers.

60. The difference of the squares of two positive integers is 180. The square of the smaller number is 8 times the larger, find the numbers.

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61. The area of a rectangular plot is $528m^2$. The length of the plot (in metres) is one metre more then twice its breadth. Find the length and the breadth of the plot.

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62. A swimming pool is filled by three pipes with uniform flow. The first two pipes operating simultaneously fill the pool in the same time during which the pool is filled by the third pipe alone. The second pipe fills the pool 5 hours faster than the first pipe and 4 hours slower than

the third pipe. The time required by the first pipe is $6\ hrs$

b. $10\ hrs$ c. $15\ hrs$ d. $30\ hrs$

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63. There is a square field whose side is 44m. A square flower bed is prepared in its centre leaving a gravel path all round the flower bed. The total cost of laying the flower bed and gravelling the path at Rs. 2.75 and Rs. 1.50 per square metre, respectively, is Rs. 4904. Find the width of the gravel path.

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64. The area of a right angled triangle is $165m^2$. Determine its base and altitude if the latter exceeds the former by 7m.

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65. The length of the sides forming right angle of a right angled triangle are $5xcm$ and $(3x-1)cm$. If the area of the triangle is $60cm^2$, find its hypotenuse.

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66. The area of an isosceles triangle is $60cm^2$ and the length of each one of its equal sides is 13 cm. Find its

base.

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67. The area of a right angled triangle is $600cm^2$. If the base of the triangle exceeds the altitude by 10cm, find the dimensions of the triangle.

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68. The perimeter of a rectangular field is 82 cm and its area is $400cm^2$. Find the breadth of the rectangle.

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69. If twice the area of a smaller square is subtracted from the area of a larger square, the result is $14cm^2$. However, if twice the area of the larger square is added to three times the area of the smaller square, the result is 203 cm^2 . Determine the sides of the square.

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70. A farmer wishes to grow a $100m^2$ rectangular vegetable garden. Since he has with the only 30 m barbed wire, the fences three sides of the rectangular garden letting compound wall of his house act as the fourth side-fence. Find the dimensions of his garden.

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71. Solve the following quadratic equations by factorization: $x^2 + 5x + 6 = 0$

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72. Solve the following quadratic equations by factorization method. $x^2 + 2\sqrt{2}x - 6 = 0$

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73. Sum of the areas of two squares is $468m^2$. If the difference of their perimeters is $24m$, formulate the quadratic equation to find the sides of the two squares.

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74. An express train takes 1 hour less than a passenger train to travel 132 km between Mysore and Bangalroe. if the average speed of the express train is 11 km/hr more than that of the passenger train, form the quadratic equation to find the average speed of express train.

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75. If $x = \frac{2}{3}$ and $x = -3$ are the roots of the equation $ax^2 + 7x + b = 0$, find the values of a and b.

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76. A two digit number is such that the product of the digits is 12. When 36 is added to the number the digits interchange their places. Formulate the quadratic equation whose root(s) is (are) digit(s) of the number.

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77. If $x = 2$ and$x = 3$ are roots of the equation $3x^2 - 2kx + 2m = 0,$ find the value of k and m.

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78. Solve the following quadratic equations by factorization method:

$$\frac{x}{x+1}+\frac{x+1}{x}=\frac{34}{15}, x \neq 0, x \neq -1$$

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79. निम्नलिखित समीकरणों को गुणनखंड विधि द्वारा हल करें-

$$\frac{2x}{x-3}+\frac{1}{2x+3}+\frac{3x+9}{(x-3)(2x+3)}=0$$

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80. A passenger train takes 3 hours less for a journey of 360 km, if its speed is increased by 10 km/hr from its usual speed. What is the usual speed?

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81. A fast train takes one hour less than a slow tran for a journey of 200 km. If the speed of the slow train is 10 km/hr less than that of the fast train, find the speed of the two trains.

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82. Swati can row her boat at a speed of 5km/hr in still water. if it takes her 1 hour more to row the boat 5.25 km upstream than to return downstream, Find the speed of the stream.

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83. A motor boat whose speed is 24 km/hr in still water takes 1 hr more to go 32 km upstream than to return downstream to the same spot. Find the speed of the stream.

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84. The sum of the squares of two consecutive multiples of 7 is 637. Find the multiples.

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85. The numerator of a fraction is 3 less than the denominator. If 2 is added to both the numerator and the

denominator, then the sum of the new fraction and the original fraction is $\frac{29}{20}$. Find the original fraction.

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86. Three consecutive positive integers are such that the sum of the square of the first and the product of other two is 46, find the integers.

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87. The difference of squares of two numbers is 88. If the larger number is 5 less than twice the smaller number, then find the two numbers.

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88. The sum of two numbers is 9. The sum of their reciprocals is ½. Find the numbers.

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89. The sum of two numbers is 9. The sum of their reciprocals is ½. Find the numbers.

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90. Solve the following quadratic equations by factorization:

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

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91. Solve the following quadratic equations by factorization: $\frac{x-a}{x-b}+\frac{x-b}{x-a}=\frac{a}{b}+\frac{b}{a}$

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92. Solve for : $x: \frac{x-1}{x-2}+\frac{x-3}{x-4}=3\frac{1}{3}, x \neq 2,4$

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93. Solve for : $a^2b^2x^2+b^2x-a^2x-1=0$

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94. Solve the following quadratic equations by factorization method: $4x^2 - 2\left(a^2 + b^2\right)x + a^2b^2 = 0$

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95. Solve: $x = \dfrac{1}{2 - \dfrac{1}{2 - \dfrac{1}{2-x}}}, x \neq 2$

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96. Solve: $x + \dfrac{1}{x} = 25$

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97. Solve the following quadratic equations by factorization method:

(i) $x^2 + \left(\frac{a}{a+b} + \frac{a+b}{a}\right)x + 1 = 0$

(ii) $x^2 + x - (x+1)(a+2) = 0$

(iii) $x^2 + 3x - \left(a^2 + a - 2\right) = 0$

(iv) $a^2b^2x^2 + b^2x - a^2x - 1 = 0$

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98. Solve for: $\frac{1}{2a+b+2x} = \frac{1}{2a} + \frac{1}{b} + \frac{1}{2x}$

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99. Solve for : $\frac{1}{x-3}+\frac{2}{x-2}=\frac{8}{x}; x \neq 0, 2, 3$

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100. The diagonal of a rectangular field is 60 metres more than the shorter side. If the longer side is 30 metres more than the shorter side, find the sides of the field.

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101. the hypotenuse of a right angle triangle is 1m less than twice the shortest side. If the third side is 1m more than the shortest side, find the sides of the triangle.

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102. The product of Ramu's age (in years) five years ago with his age (in years) 9 years later is 15. Find Ramu's present age.

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103. One year ago, a man was 8 times as old as his son. Now his age is equal to the square of his son's age. Find their present ages.

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104. A girl is twice as old as her sister. Four years hence, the product of their ages (in years) will be 160. Find their present ages.

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105. Seven years ago Varun's age was five times the square of Swati's age. Three years hence Swati's age will be two fifth of Varun's age. Find their present ages.

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106. While boarding an aeroplane, a passenger got hurt. The pilot showing promptness and concern, made

arrangements to hospitalise the injured and so the plane started late 30 minutes to reach the destination, 1500 km away in time, the pilot increased the speed by 100 km/hr. Find the original speed/hour of the plane.

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107. While boarding an aeroplane, a passenger got hurt. The pilot showing promptness and concern, made arrangements to hospitalise the injured and so the plane started late 30 minutes to reach the destination, 1500 km away in time, the pilot increased the speed by 100 km/hr. Find the original speed/hour of the plane.

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108. A motor boat whose speed is 18 km/h m still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

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109. about to only mathematics

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110. Solve for: $\frac{4}{x} - 3 = \frac{5}{2x+3}, x \neq 0, , -\frac{3}{2}$

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111. Solve for x: $\frac{x-4}{x-5}+\frac{x-6}{x-7}=\frac{10}{3}; x \neq 5, 7$

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112. Solve for : $\frac{5+x}{5-x}-\frac{5-x}{5+x}=3\frac{3}{4}; x \neq 5, -5$

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113. Solve for : $\frac{3}{x+1}-\frac{1}{2}=\frac{2}{3x-1}, x \neq \frac{3}{5}, -\frac{1}{7}$

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114. Solve for : $\frac{2}{x+1}+\frac{3}{2(x-2)}=\frac{23}{5x}; x \neq 0, -1, 2$

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115. Find the roots of the following equation $4x^2 + 4bx - (a^2 - b^2) = 0$ by the method of completing the square.

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116. Find the roots of the equation $a^2x^2 - 3abx + 2b^2 = 0$ by the method of completing the square.

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117. Solve the equation $x^2 - (\sqrt{3}+1)x + \sqrt{3} = 0$ by the method of completing the square.

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118. Find the roots of the quadratic equations (if they exist) by the method of completing the square. $4x^2 + 4\sqrt{3}x + 3 = 0$

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119. Find the roots of the quadratic equations (if they exist) by the method of completing the square. $\sqrt{3}x^2 + 10x + 7\sqrt{3} = 0$

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120. If the roots of the equation $x^2 + 2cx + ab = 0$ are real unequal, prove that the equation $x^2 - 2(a+b)x + a^2 + b^2 + 2c^2 = 0$ has no real roots.

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121. If $p, q, rands$ are real numbers such that $pr = 2(q+s)$, then show that at least one of the equations $x^2 + px + q = 0$ and $x^2 + rx + s = 0$ has real roots.

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122. Find the values of k for which the equation $x^2 + 5kx + 16 = 0$ has no real roots.

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123. If p, q are real $p \neq q,$ then show that the roots of the equation $(p-q)x^2 + 5(p+q)x - 2(p-q) = 0$ are real and unequal.

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124. $If -4$ is a root of the quadratic equation $x^2 + px - 4 = 0$ and the quadratic equation $x^2 + px + k = 0$ has equal roots, find the value of k.

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125. Find the values of k for which the following equation has equal roots: $(k-12)x^2+2(k-12)x+2=0$

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126. Find the value of k for which the given equation has real and equal roots:

$2x^2-10x+k=0$

$9x^2+3kx+4=0$

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127. Determine the nature of the roots of the following quadratic equations:

$2x^2 + x - 1 = 0$

$x^2 - 4x + 4 = 0$

$x^2 + x + 1 = 0$

$4x^2 - 4x + 1 = 0$

$2x^2 + 5x + 5 = 0$

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128. Using quadratic formula, solve the following equation for x : $abx^2 + \left(b^2 - ac\right)x - bc = 0$

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129. Using quadratic formula solve the following quadratic equations: $p^2x^2 + (p^2 - q^2)x - q^2 = 0, p \neq 0$

$9x^2 - 9(a+b)x + (2a^2 + 5ab + 2b^2) = 0$

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130. Solve the following quadratic equations by factorization method: $\frac{x+3}{x-2} - \frac{1-x}{x} = \frac{17}{4}$

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131. Solve the following quadratic equations by factorization method: $\frac{1}{x-2} + \frac{2}{x-1} = \frac{6}{x}$

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132. Which of the following are quadratic equations?

(i)$x^2 - 6x + 4 = 0$

(ii) $2x^2 - 7x = 0$

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133. Which of the following are quadratic equations?

(i)$x + \frac{3}{x} = x^2$

(ii) $x^2 + \frac{1}{x^2} = 2$

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134. Which of the following are quadratic equations?

$x^2 + 2\sqrt{x} - 3 = 0$ (ii)

$3x^2 - 4x + 2 = 0 (iii) 2x^2 - 2x + 4$

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135. In each of the following determine whether the given values are solution of the given equation or not:

(i) $3x^2 - 2x - 1 = 0, \quad x = 1$

(ii) $6x^2 - x - 2 = 0, \quad x = -1/2, \quad x = 2/3$

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136. In each of the following determine whether the given values are solution of the given equation or not:

(i) $x^2 - x + 1 = 0, \quad x = 1, \; x = -1$

(ii) $x^2 + \sqrt{2}x - 4 = 0, \quad x = \sqrt{2}, \quad x = -2\sqrt{2}$

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137. In each of the following, determine the value of k for which the given value is a solution of the equation:

(i) $kx^2 + 2x - 3 = 0, \quad x = 2$

(ii) $3x^2 + 2kx - 3 = 0, \quad x = -\frac{1}{2}$

(iii) $x^2 + 2ax - k = 0, \quad x = -a$

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138. If one root of the quadratic equation $2x^2 + kx - 6 = 0$ is 2, find the value of k . Also, find the other root.

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139. Which of the following are quadratic equations?

$x^2 + 6x - 4 = 0$ (ii) $\sqrt{3}x^2 - 2x + \frac{1}{2} = 0$ (iii) $x^2 + \frac{1}{x^2} = 5$

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140. Which of the following are quadratic equations?

$(i)x - \frac{3}{x} = x^2$ (ii) $2x^2 - \sqrt{3}x + 9 = 0$ (iii)

$x^2 - 2x - \sqrt{x} - 5 = 0$

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141. Which of the following are quadratic equations?

$3x^2 - 5x + 9 = x^2 - 7x + 3$ (ii) $x + \frac{1}{x} = 1$ (iii) $x^2 - 3x = 0$

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142. Which of the following are quadratic equations?

(i) $\left(x + \frac{1}{x}\right)^2 = 3\left(x + \frac{1}{x}\right) + 4$

(ii) $(2x + 1)(3x + 2) = 6(x - 1)(x - 2)$

(iii) $x + \frac{1}{x} = x^2, \quad x \neq 0$

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143. Which of the following are quadratic equations?

(i)$16x^2 - 3 = (2x + 5)(5x - 3)$

(ii) $(x + 2)^3 = x^3 - 4$

(iii) $x(x + 1) + 8 = (x + 2)(x - 2)$

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144. In each of the following, determine whether the given values are solutions of the given equation or not:

(i)$x^2 - 3x + 2 = 0, \quad x = 2, \; x = -1$

(ii) $x^2 + x + 1 = 0, \quad x = 0, \; x = 1$

(iii) $x^2 - 3\sqrt{3}x + 6 = 0, \quad x = \sqrt{3}, \quad x = -2\sqrt{3}$

(iv) $x + \frac{1}{x} = \frac{13}{6}, \quad x = \frac{5}{6}, \quad x = \frac{4}{3}$

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145. In each of the following, determine whether the given values are solutions of the given equation or not:

(i) $2x^2 - x + 9 = x^2 + 4x + 3, \quad x = 2, \quad x = 3$

(ii) $x^2 - \sqrt{2}x - 4 = 0, \quad x = -\sqrt{2}, \quad x = -2\sqrt{2}$

(iii) $a^2x^2 - 3abx + 2b^2 = 0, \quad x = a/b, \quad x = b/a$

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146. In each of the following, find the value of k for which the given value is a solution of the given equation:

(i) $7x^2 + kx - 3 = 0, \quad x = 2/3$

(ii) $x^2 - x(a + b) + k = 0, \quad x = a$

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147. In each of the following, find the value of k for which the given value is a solution of the given equation:

(i) $kx^2 + \sqrt{2}x - 4 = 0, \quad x = \sqrt{2}$

(ii) $x^2 + 3ax + k = 0, \quad x = -a$

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148. Determine, if 3 is a root of the equation given below:

$$\sqrt{x^2 - 4x + 3} + \sqrt{x^2 - 9} = \sqrt{4x^2 - 14x + 16}$$

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149. The product of two consecutive positive integers is 240. Formulate the quadratic equation whose roots are these integers.

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150. The area of a rectangular plot is $528\ m^2$. The length of the plot (in metres) is one more than twice its breadth. Formulate the quadratic equation to determine the length and breadth of the plot.

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151. Rohan's mother is 26 years older than him. The product of their ages 3 years from now will be 360. Formulate the quadratic equation to find their ages.

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152. A train travels a distance of 480 km at a uniform speed. If the speed had been 8 km/hr less, then it would have taken 3 hours more to cover the same distance. Formulate the quadratic equation in terms of the speed of the train.

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153. The product of two consecutive positive integers is 306. Form the quadratic equation to find the integers, if x denotes the smaller integer.

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154. John and Jivanti together have 45 marbles. Both of them lost 5 marbles each, and the product of the number of marbles they now have is 128. Form the quadratic equation to find how many marbles they had to start with, if John had x marbles.

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155. A cottage industry produces a certain number of toys in a day. The cost of production of each toy (in rupees) was found to be 55 minus the number of articles produced in a day. On a particular day, the total cost of production was Rs. 750. If x denotes the number of toys produced that day, form the quadratic equation to find x .

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156. The height of a right triangle is 7cm less than its base. If the hypotenuse is 13cm, form the quadratic equation to find the base of the triangle.

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157. A train travels 360 km at a uniform speed. If the speed had been 5km/hr more, it would have taken 1 hour less for the same journey. Form the quadratic equation to find the speed of the train.

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158. Solve the following quadratic equations by factorization method:

(i)$x^2 - 9 = 0$

(ii) $x^2 - 8x + 16 = 0$

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159. Solve the following quadratic equations by factorization method:

$$\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}, \quad a+b \neq 0$$

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160. Solve by factorization: $(x-4)(x+2) = 0$

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161. Solve by factorization: $(2x+3)(3x-7) = 0$

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162. Solve by factorization: $x^2 - (\sqrt{3}+1)x + \sqrt{3} = 0$

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163. Solve by factorization: $9x^2 - 3x - 2 = 0$

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164. Solve by factorization: $3\sqrt{5}x^2 + 25x - 10\sqrt{5} = 0$

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165. Solve by factorization: $6x^2 + 11x + 3 = 0$

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166. Solve by factorization: $5x^2 - 3x - 2 = 0$

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167. Solve by factorization: $48x^2 - 13x - 1 = 0$

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168. Solve by factorization: $3x^2 = -11x - 10$

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169. Solve by factorization: $25x(x + 1) = -4$

Watch Video Solution

170. Solve by factorization: $16x - \frac{10}{x} = 27$

Watch Video Solution

171. Solve by factorization: $\sqrt{3}x^2 - 2\sqrt{2}x - 2\sqrt{3} = 0$

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172. Solve: $4\sqrt{3}x^2 + 5x - 2\sqrt{3} = 0.$

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173. Solve by factorization: $\sqrt{2}x^2 - 3x - 2\sqrt{2} = 0$

Watch Video Solution

174. Solve by factorization: $a^2x^2 - 3abx + 2b^2 = 0$

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175. Solve by factorization: $x^2 - \left(\sqrt{2}+1\right)x + \sqrt{2} = 0$

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176. Solve by factorization: $9x^2 - 6b^2x - \left(a^4 - b^4\right) = 0$

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177. Solve by factorization: $4x^2 + 4bx - \left(a^2 - b^2\right) = 0$

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178. Solve by factorization:

$ax^2 + \left(4a^2 - 3b\right)x - 12ab = 0$

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179. Solve by factorization: $2x^2 + ax - a^2 = 0$

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180. Solve by factorization: $x^2 - 4\sqrt{2}x + 6 = 0$

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181. Solve by factorization: $\frac{x+3}{x+2} = \frac{3x-7}{2x-3}$

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

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183. Solve by factorization: $\frac{x+3}{x-2} - \frac{1-x}{x} = \frac{17}{4}$

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184. Solve by factorization:

$$\frac{x-3}{x+3}-\frac{x+3}{x-3}=\frac{48}{7},\ x\neq 3,\ x\neq -3$$

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185. Solve by factorization:

$$\frac{1}{x-2}+\frac{2}{x-1}=\frac{6}{x},\ x\neq 0$$

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186. Solve by factorization:

$$\frac{x+1}{x-1}-\frac{x-1}{x+1}=\frac{5}{6},\ x\neq 1,\ -1$$

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187. Solve by factorization:

$$\frac{x-1}{2x+1}+\frac{2x+1}{x-1}=\frac{5}{2},\ x\neq -\frac{1}{2},\ 1$$

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188. Solve by factorization: $3x^2-14x-5=0$

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189. Solve by factorization: $\frac{m}{n}x^2+\frac{n}{m}=1-2x$

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190. $Solve: (x-5)(x-6) = \frac{25}{(24)^2}$

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191. Solve by factorization: $7x + \frac{3}{x} = 35\frac{3}{5}$

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192. Solve by factorization: $\frac{a}{x-a} + \frac{b}{x-b} = \frac{2c}{x-c}$

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193. Solve by factorization: $x^2 + 2ab = (2a+b)x$

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194. Solve by factorization:

$(a+b)^2x^2 - 4abx - (a-b)^2 = 0$

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195. Solve by factorization: $a\left(x^2+1\right) - x\left(a^2+1\right) = 0$

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196. Solve by factorization: $x^2 + \left(a + \frac{1}{a}\right)x + 1 = 0$

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197. Solve by factorization: $abx^2 + (b^2 - ac)x - bc = 0$

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198. Solve by factorization: $3x^2 - 2\sqrt{6}x + 2 = 0$

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199. Solve by factorization:

$$\frac{1}{x-1} - \frac{1}{x+5} = \frac{6}{7}, \quad x \neq 1, \quad -5$$

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200. Solve by factorization: $\frac{1}{x} - \frac{1}{x-2} = 3, \quad x \neq 0, \ 2$

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201. Solve by factorization: $x - \frac{1}{x} = 3, \quad x \neq 0$

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202. Solve by factorization:

$$\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}, \quad x \neq 4, \ 7$$

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203. Solve by factorization:

$$\frac{16}{x} - 1 = \frac{15}{x+1}; \quad x \neq 0, \quad -1$$

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204. Solve by factorization:

$$\frac{x-2}{x-3}+\frac{x-4}{x-5}=\frac{10}{3};\ x\neq 3,\ 5$$

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205. Solve the quadratic equation $9x^2-15x+6=0$ by the method of completing the square.

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206. Solve the equation $2x^2-5x+3=0$ by the method of completing square.

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207. Find the roots of the equation $5x^2 - 6x - 2 = 0$ by the method of completing the square.

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208. By using the method of completing the square, show that the equation $4x^2 + 3x + 5 = 0$ has no real roots.

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209. Find the roots (if they exist) by completing the square: $x^2 - 4\sqrt{2}x + 6 = 0$

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210. Find the roots (if they exist) by completing the square: $2x^2 - 7x + 3 = 0$

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211. Find the roots (if they exist) by completing the square: $3x^2 + 11x + 10 = 0$

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212. Find the roots of the following quadratic equations, if they exist, by the method of completing the square:

$2x^2 + x - 4 = 0$

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213. Find the roots (if they exist) by completing the square: $2x^2 + x + 4 = 0$

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214. Find the roots (if they exist) by completing the square: $\sqrt{2}x^2 - 3x - 2\sqrt{2} = 0$

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215. Find the roots (if they exist) by completing the square: $x^2 - (\sqrt{2}+1)x + \sqrt{2} = 0$

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216. Find the roots (if they exist) by completing the square: $x^2 - 4ax + 4a^2 - b^2 = 0$

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217. Write the discriminant of the following quadratic equations: $x^2 - 4x + 2 = 0$ (ii) $3x^2 + 2x - 1 = 0$ (iii) $x^2 - 4x + a = 0$

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218. Write the discriminant of the following quadratic equations: $\sqrt{3}x^2 - 2\sqrt{2}x - 2\sqrt{3} = 0$ (ii) $x^2 + x + 1 = 0$ (iii) $x^2 + px + 2q = 0$

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219. In the following, determine whether the given quadratic equations have real roots and if so, find the roots $9x^2 + 7x - 2 = 0$ (ii) $2x^2 + 5\sqrt{3}x + 6 = 0$

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220. In the following, determine whether the given quadratic equations have real roots and if so, find the roots

(i)$3x^2 + 2\sqrt{5}x - 5 = 0$

(ii) $x^2 + 5x + 5 = 0$

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221. In the following, determine whether the given quadratic equations have real roots and if so, find the roots

(i)$6x^2 + x - 2 = 0$

(ii) $25x^2 + 20x + 7 = 0$

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222. Solve for x : $\frac{x-1}{x+2}+\frac{x-3}{x-4}=\frac{10}{3}, \quad x \neq -2, 4$

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223. Solve for x :

$$\frac{1}{x+1}+\frac{2}{x+2}=\frac{4}{x+4}, \quad x \neq 1, -2, -4$$

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224. Write the discriminant of the following quadratic equations: $2x^2-5x+3=0$ (ii) $x^2+2x+4=0$

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225. Write the discriminant of the following quadratic equations: $(x-1)(2x-1)=0$ (ii) $x^2-2x+k=0,\quad k\in R$

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226. Write the discriminant of the following quadratic equations: $\sqrt{3}x^2+2\sqrt{2}x-2\sqrt{3}=0$ (ii) $x^2-x+1=0$

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227. In the following, determine whether the given quadratic equations have real roots and if so, find the roots:

(i)$16x^2 = 24x + 1$

(ii) $x^2 + x + 2 = 0$

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228. In the following, determine whether the given quadratic equations have real roots and if so, find the roots:

(i)$\sqrt{3}x^2 + 10x - 8\sqrt{3} = 0$

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

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229. In the following, determine whether the given quadratic equations have real roots and if so, find the

roots:

(i) $2x^2 - 2\sqrt{6}x + 3 = 0$

(ii) $3a^2x^2 + 8abx + 4b^2 = 0, \quad a \neq 0$

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230. In the following, determine whether the given quadratic equations have real roots and if so, find the roots:

(i) $3x^2 + 2\sqrt{5}x - 5 = 0$

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

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231. In the following, determine whether the given quadratic equations have real roots and if so, find the roots:

(i)$2x^2 + 5\sqrt{3}x + 6 = 0$

(ii) $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$

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232. In the following, determine whether the given quadratic equations have real roots and if so, find the roots:

(i)$2x^2 - 2\sqrt{2}x + 1 = 0$

(ii) $3x^2 - 5x + 2 = 0$

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233. Solve for x : $\frac{x-1}{x-2}+\frac{x-3}{x-4}=3\frac{1}{3};\ \ x\neq 2,\ 4$

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234. Solve for x : $\frac{1}{x}-\frac{1}{x-2}=3,\ \ x\neq 0,\ 2$

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235. Solve for x : $x+\frac{1}{x}=3,\ \ x\neq 0$

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236. Solve for x : $\frac{16}{x}-1=\frac{15}{x+1},\ \ x\neq 0,\ \ -1$

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237. Find the values of k for which the equation $x^2 - 4x + k = 0$ has distinct real roots.

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238. Show that the equation $x^2 + ax - 4 = 0$ has real and distinct roots for all real values of a .

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239. The positive value of k for which the equation $x^2 + kx + 64 = 0$ and $x^2 - 8x + k = 0$ will both have

real roots, is

(a)4 (b) 8 (c) 12 (d) 16

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240. Find the values of k for which the given equation has real roots: $kx^2 - 6x - 2 = 0$

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241. Find the values of k for which the given equation has real roots: $9x^2 + 3kx + 4 = 0$

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242. Find the values of k for which the given equation has real roots: $5x^2 - kx + 1 = 0$

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243. Find the value of k for which the equation $9x^2 - 24x + k = 0$ has equal roots. Also, find the roots.

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244. Find the value of k for which the equation $2kx^2 - 40x + 25 = 0$ has equal roots. Also, find the roots.

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245. Determine the nature of the roots of the following quadratic equations:

(i)$2x^2 - 3x + 5 = 0$

(ii) $2x^2 - 6x + 3 = 0$

(iii) $\frac{3}{5}x^2 - \frac{2}{3}x + 1 = 0$

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246. Determine the nature of the roots of the following quadratic equations:

(i)$3x^2 - 4\sqrt{3}x + 4 = 0$

(ii) $3x^2 - 2\sqrt{6}x + 2 = 0$

(iii) $(x - 2a)(x - 2b) = 4ab$

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247. Determine the nature of the roots of the following quadratic equations:

(i) $9a^2b^2x^2 - 24abcdx + 16c^2d^2 = 0, \quad a \neq 0, \ b \neq 0$

(ii) $2\left(a^2 + b^2\right)x^2 + 2(a + b)x + 1 = 0$

(iii) $(b + c)x^2 - (a + b + c)x + a = 0$

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248. Find the values of k for which the roots are real and equal in the following equations:

(i) $kx^2 + 4x + 1 = 0$

(ii) $kx^2 - 2\sqrt{5}x + 4 = 0$

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249. Find the values of k for which the roots are real and equal in the following equations:

(i)$3x^2 - 5x + 2k = 0$

(ii) $4x^2 + kx + 9 = 0$

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250. Find the values of k for which the roots are real and equal in the following equations:

(i)$2kx^2 - 40x + 25 = 0$

(ii) $9x^2 - 24x + k = 0$

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251. Find the values of k for which the roots are real and equal in the following equations:

(i)$4x^2 - 3kx + 1 = 0$

(ii) $x^2 - 2(5 + 2k)x + 3(7 + 10k) = 0$

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252. Find the values of k for which the roots are real and equal in the following equations:

(i)$(3k + 1)x^2 + 2(k + 1)x + k = 0$

(ii) $kx^2 + kx + 1 = -4x^2 - x$

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253. Find the values of k for which the roots are real and equal in the following equations:

(i)$(k+1)x^2+2(k+3)x+(k+8)=0$

(ii) $x^2-2kx+7k-12=0$

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254. Find the values of k for which

$(k+1)x^2-2(3k+1)x+8k+1=0$

has real and equal roots.

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255. Find the values of k for which $5x^2 - 4x + 2 + k(4x^2 - 2x - 1) = 0$ has real and equal roots.

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256. Find the values of k for which $(4 - k)x^2 + (2k + 4)x + (8k + 1) = 0$ has real and equal roots.

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257. Find the values of k for which $(2k + 1)x^2 + 2(k + 3)x + (k + 5) = 0$ has real and

equal roots.

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258. Find the values of k for which $4x^2 - 2(k+1)x + (k+4) = 0$ has real and equal roots.

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259. Find the values of k for which the roots are real and equal in the following equations:

(i) $x^2 - 2(k+1)x + k^2 = 0$

(ii) $k^2x^2 - 2(2k-1)x + 4 = 0$

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260. Find the values of k for which the roots are real and equal in the following equations:

(i)$(k+1)x^2 - 2(k-1)x + 1 = 0$

(ii) $2x^2 + kx + 3 = 0$

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261. Find the values of k for which the roots are real and equal in the following equations:

(i)$kx(x-2) + 6 = 0$

(ii) $x^2 - 4kx + k = 0$

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262. Find the values of k for which the roots are real and equal in the following equations:

(i)$kx\left(x-2\sqrt{5}\right)+10=0$

(ii) $kx(x-3)+9=0$

(iii) $4x^2+kx+3=0$

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263. In the following, determine the set of values of k for which the given quadratic equation has real roots:

(i)$2x^2+3x+k=0$

(ii) $2x^2+kx+3=0$

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264. In the following, determine the set of values of k for which the given quadratic equation has real roots:

(i)$2x^2 - 5x - k = 0$

(ii) $kx^2 + 6x + 1 = 0$

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265. In the following, determine the set of values of k for which the given quadratic equation has real roots:

(i)$x^2 - kx + 9 = 0$

(ii) $2x^2 + kx + 2 = 0$

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266. In the following, determine the set of values of k for which the given quadratic equation has real roots:

(i)$3x^2 + 2x + k = 0$

(ii) $4x^2 - 3kx + 1 = 0$

(iii) $2x^2 + kx - 4 = 0$

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267. Find the values of k for which the given quadratic equation has real and distinct roots:

(i)$kx^2 + 2x + 1 = 0$

(ii) $kx^2 + 6x + 1 = 0$

(iii) $x^2 - kx + 9 = 0$

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268. The sum of a number and its reciprocal is $2\frac{1}{30}$. Find the number.

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269. A two digit number is such that the product of the digits is 14. When 45 is added to the number, then the digits are reversed. Find the number.

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270. Divide 16 into two parts such that twice the square of the larger part exceeds the square of the smaller part by

164.

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271. The sum of the squares of two positive integers is 208. If the square of the larger number is 18 times the smaller number, find the numbers.

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272. If the sum of n successive odd natural numbers starting from 3 is 48, find the value of n .

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273. Find two consecutive odd positive integer. Then, an odd positive integer just greater than x is $x + 2$.

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274. Find two consecutive numbers whose squares have the sum 85.

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275. Divide 29 into two parts so that the sum of the squares of the parts is 425.

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276. The sum of two numbers is 48 and their product is 432. Find the numbers.

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277. Find the whole number which when decreased by 20 is equal to 69 times the reciprocal of the number.

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278. Find two consecutive natural numbers whose product is 20.

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279. The sum of the squares of two consecutive odd positive integers is 394. Find them.

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280. The sum of two numbers is 8 and 15 times the sum of their reciprocals is also 8. Find the numbers.

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281. The sum of a number and its square is $63/4$, find the numbers.

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282. There are three consecutive integers such that the square of the first increased by the product of the other two gives 154. What are the integers?

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283. The product of two successive integral multiples of 5 is 300. Determine the multiples.

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284. The sum of the squares of two numbers is 233 and one of the numbers is 3 less than twice the other number. Find the numbers.

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285. Find the consecutive even integers whose squares have the sum 340.

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286. Find two natural numbers which differ by 3 and whose squares have the sum 117.

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287. Determine two consecutive multiples of 3 whose product is 270.

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288. The sum of a number and its reciprocal is $17/4$. Find the number.

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289. A two-digit number is such that the product of its digits is 8. When 18 is subtracted from the number, the digits interchange their places. Find the number.

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290. A two-digit number is such that the product of the digits is 12. When 36 is added to the number the digits interchange their places. Determine the number.

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291. A two-digit number is such that the product of its digits is 16. When 54 is subtracted from the number, the digits are interchanged. Find the number.

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292. A two digit number is 4 times the sum of its digits and twice the product of its digits. Find the number.

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293. The difference of squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find two numbers.

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294. Find two consecutive odd positive integers, sum of whose squares is 970.

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295. The difference of two natural numbers is 3 and the difference of their reciprocals is $\frac{3}{28}$. Find the numbers.

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296. The sum of the squares of two consecutive odd numbers is 394. Find the numbers.

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297. The sum of the squares of two consecutive even numbers is 340. Find the numbers.

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298. A train travels a distance of 300 km at constant speed. If the speed of the train is increased by 5 km an hour, the journey would have taken 2 hours less. Find the original speed of the train.

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299. The speed of a boat in still water is 15 km/hr. It can go 30 km upstream and return downstream to the original point in 4 hours 30 minutes. Find the speed of the stream.

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300. A fast train takes 3 hours less than a slow train for a journey of 600 km. If the speed of slow train is 10 km/ hr, less than that the fast train, then the speeds of the two trains can be

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301. A plane left 30 minutes late than its scheduled time and in order to reach the destination1500 km away in time, it had to increase the speed by 100 km/h from the usual speed.Find its usual speed.

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302. In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/hr and the time of flight increased by 30 minutes. Find the duration of flight.

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303. Two trains leave a railway station at the same time. The first train travels towards west and the second train towards north. The first train travels 5 km/hr faster than the second train. If after two hours they are 50 km apart find the average speed of each train.

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304. A passenger train takes one hour less for a journey of 150 km if its speed is increased by 5 km/hr from its usual speed. Find the usual speed of the train.

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305. The time taken by a person to cover 150 km was 2.5 hrs more than the time taken in the return journey. If he returned at a speed of 10 km/hr more than the speed of going, what was the speed per hour in each direction?

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306. An aeroplane takes 1 hour less for a journey of 1200 km if its speed is increased by 100 km/hr from its usual speed. Find its usual speed.

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307. A passenger train takes 2 hours less for a journey of 300 km if its speed is increased by 5 km/hr from its usual speed. Find the usual speed of the train.

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308. A train covers a distance of 90 km at a uniform speed. Had the speed been 15 km/hr more, it would have taken

30 minutes less for the journey. Find the original speed of the train.

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309. A train travels 360 km at a uniform speed. If the speed had been 5km/hr more, it would have taken 1 hour less for the same journey. Form the quadratic equation to find the speed of the train.

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310. An express train takes 1 hour less than a passenger train to travel 132 km between Mysore and Bangalore (without taking into consideration the time they stop at

intermediate stations). If the average speed of the express train is 11km h more than that of the passenger train, find the average speed of the two trains.

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311. The sum of the ages of father and his son is 45 years . 5 years ago the products of their ages was 124. Find the present ages .

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312. Ashu is x years old while his mother Mrs Veena is x^2 years old. Five years hence Mrs Veena will be three times old as Ashu. Find their present ages.

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313. The sum of the ages of a man and his son is 45 years. Five years ago, the product of their ages was four times the man's age at the time. Find their present ages.

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314. The product of Shikha's age five years ago and her age 8 years later is 30, her age at both times being given in years. Find her present age.

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315. The product of Ramu's age (in years) five years ago with his age (in years) 9 years later is 15. Find Ramu's present age.

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316. Determine their present ages. The sum of the ages of two friends is 20 years. Four years ago, the product of their ages in years was 48.

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317. The sum of the reciprocals of Rehmans ages, (in years) 3 years ago and 5 years from now is $\frac{1}{3}$. Find his

present age.

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318. The hypotenuse of a right triangle is 6 m more than the twice of the shortest side. If the third side is 2 m less than the hypotenuse, find the sides of the triangle.

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319. The hypotenuse of a right triangle is $3\sqrt{5}$ cm. If the smaller side is tripled and the larger side is doubled, the new hypotenuse will be 15cm. Find the length of each side.

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320. Vikram wishes to fit three rods together in the shape of a right triangle. The hypotenuse is to be 2 cm longer than the base and 4 cm longer than the altitude. What should be the lengths of the rods

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321. The hypotenuse of a right triangle is 25 cm. The difference between the lengths of the other two sides of the triangle is 5 cm. Find the lengths of these sides.

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322. The hypotenuse of a right triangle is $3\sqrt{10}cm$. If the smaller leg is tripled and the longer leg doubled, new hypotenuse will be $9\sqrt{5}cm$. How long are the legs of the triangle?

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323. A pole has to be erected at a point on the boundary of a circular park of diameter 13 metres in such a way that the differences of its distances from two diametrically opposite fixed gates A and B on the boundary is 7 metres. Is it possible t

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324. The perimeter of a right angled triangle is 60 cm. Its hypotenuse is 25 cm. Find the area of the triangle.

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325. The length of a rectangle exceeds its width by 8 cm and the area of the rectangle is 240 sq. cm. Find the dimensions of the rectangle.

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326. The side of a square exceeds the side of the another square by 4 cm and the sum of the areas of the two squares is 400 sq. cm. Find the dimensions of the squares.

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327. A chess board contains 64 equal squares and the area of each square is $6.25\ cm^2$. A border round the board is 2 cm wide. Find the length of the side of the chess board.

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328. The perimeter of a rectangular field is 82 cm and its area is $400 cm^2$. Find the breadth of the rectangle.

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329. The length of a hall is 5 m more than its breadth. If the area of the floor of the hall is $84m^2$, what are the length and breadth of the hall?

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330. Two squares have sides xcm and $(x+4)$. The sum of their areas is $656cm^2$. Find the sides of the squares.

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331. Is it possible to design a rectangular mango grove whose length is twice its breadth and the area is $800m^2$? If so, find its length and breadth.

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332. Is it possible to design a rectangular park of perimeter 80 m and area 400 m2? If so, find its length and breadth.

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333. Sum of the areas of two squares is $640m^2$. If the difference of their perimeters is 64m, find the sides of the two squares.

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334. Sum of the areas of two squares is 400 cm. If the difference of their perimeters is 16 cm, find the sides of the two squares.

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335. A takes 6 days less than the time taken by B to finish a piece of work. If both A and B together can finish it in 4 days . Find the time taken by B to finish the work.

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336. A takes 10 days less than the time taken by B to finish a piece of work. If both A and B together can finish the

work in 12 days, find the time taken by B to finish the work.

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337. If two pipes function simultaneously, a reservoir will be filled in 12 hours. One pipe fills the reservoir 10 hours faster than the other. How many hours will the second pipe take to fill the reservoir?

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338. Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of larger diameter takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.

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339. Two pipes running together can fill a tank in $11\frac{1}{9}$ minutes. If one pipe takes 5 minutes more than the other to fill the tank separately, find the time in which each pipe would fill the tank separately.

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340. A person on the tour has Rs 360 on the expenses . If he extends his tour for 4 days ; he has to cut down the daily expenses by Rs 3 . Find the original duration of the tour.

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341. Rs 6500 were divided equally among a certain number of persons. Had there been 15 more persons, each would have got Rs 30 less. Find the original number of persons.

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342. A dealer sells a toy for Rs 24 and gains as much per cent as the cost price of the toy. Find the cost price of the toy.

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343. A piece of cloth costs Rs 35. If the piece were 4m longer and each metre costs Rs. one less, the cost would remain unchanged. How long is the piece?

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344. Some students planned a picnic.The budget for food was Rs.480. But , 8 of these failed to go and thus the cost of food for each member increased by Rs 10. How many students attended the picnic?

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345. A dealer sells an article for Rs. 24 and gains as much percent as the cost price of the article. Find the cost price of the article.

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346. Girl! Out of a group of swans. $\frac{7}{2}$ times the square root of the number are playing on the shore of a tank. The two remaining ones are playing, with amorous fight, in the water. What is the total number of swans?

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347. If the list price of a toy is reduced by Rs. 2, a person can buy 2 toys more for Rs. 360. Find the original price of the toy.

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348. Some students planned a picnic. The budget for food was Rs. 500. But 5 of them failed to go and thus the cost of food for each member increased by Rs. 5. How many students attended the picnic?

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349. In a class test, the sum of the marks obtained by P in Mathematics and science is 28. Had he got 3 marks more in Mathematics and 4 marks less in Science. The product of his marks, would have been 180. Find his marks in the two subjects.

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350. In a class test, the sum of Shefalis marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and 3 marks less in English, the product of their marks would have been 210. Find her marks in the two subjects.

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351. A cottage industry produces a certain number of pottery articles in a day. It was observed on a particular day that the cost of production of each article (in rupees) was 3 more than twice the number of articles produced on that day. If the total cost of production on that day was Rs 90. Find the number of articles produced and the cost of each article.

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352. Write the value of k for which the quadratic equation $x^2 - kx + 4 = 0$ has equal roots.

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353. What is the nature of roots of the quadratic equation $4x^2 - 12x - 9 = 0$?

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354. Write the number of real roots of the equation $x^2 + 3|x| + 2 = 0$.

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355. Write the set of values of $'a'$ for which the equation $x^2 + ax - 1 = 0$ has real roots.

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356. Is there any real value of $'a'$ for which the equation $x^2 + 2x + \left(a^2 + 1\right) = 0$ has real roots?

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357. Write the value of λ for which $x^2 + 4x + \lambda$ is a perfect square.

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358. Find the condition if the roots of $ax^2 + 2bx + c = 0 and bx^2 - 2\sqrt{ac}x + b = 0$ are simultaneously real.

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359. Write the set of values of k for which the quadratic equation has $2x^2 + kx - 8 = 0$ has real roots.

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360. Write a quadratic polynomial, sum of whose zeros is $2\sqrt{3}$ and their product is 2.

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361. Show that $x = -3$ is solution of $x^2 + 6x + 9 = 0$

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362. Show that $x = -2$ is a solution of $3x^2 + 13x + 14 = 0$

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363. Find the discriminant of the quadratic equation $3\sqrt{3}x^2 + 10x + \sqrt{3} = 0.$

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364. If $x = \frac{-1}{2}$, is a solution of the quadratic equation $3x^2 + 2kx - 3 = 0$, find the value of k.

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365. If the equation $x^2 + 4x + k = 0$ has real and distinct roots, then

(a)$k < 4$ (b) $k > 4$ (c) $k \geq 4$ (d) $k \leq 4$

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366. If the equation $9x^2 + 6kx + 4 = 0$ has equal roots, then the roots are both equal to

(a)$\pm \frac{2}{3}$ (b) $\pm \frac{3}{2}$ (c) 0 (d) ± 3

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367. If the equation $ax^2 + 2x + a = 0$ has two distinct roots, if

(a)$a = \pm 1$ (b) $a = 0$ (c) $a = 0,\ 1$ (d) $a = -1,\ 0$

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368. If 2 is a root of the equation $x^2 + bx + 12 = 0$ and the equation $x^2 + bx + q = 0$ has equal roots, then $q =$

(a) 8 (b) -8 (c) 16 (d) -16

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369. If the roots of the equation $\left(a^2 + b^2\right)x^2 - 2b(a + c)x + \left(b^2 + c^2\right) = 0$ are equal,

then

(a) $2b = a + c$ (b) $b^2 = ac$ (c) $b = \frac{2ac}{a+c}$ (d) $b = ac$

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370. If the equation $x^2 - bx + 1 = 0$ does not possess real roots, then range of b

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371. If $x = 1$ is a common root of the equations $ax^2 + ax + 3 = 0$ and $x^2 + x + b = 0$, then $ab =$

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372. If p and q are the roots of the equation $x^2 - px + q = 0$, then

(a)$p = 1,\ q = -2$ (b) $p = 1,\ q = 0$ (c) $p = -2,\ q = 0$

(d) $p = -2,\ q = 1$

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373. If a and b can take values $1,\ 2,\ 3,\ 4$. Then the number of the equations of the form $ax^2 + bx + 1 = 0$ having real roots is

(a) 10 (b) 7 (c) 6 (d) 12

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374. Write the number of quadratic equation with real roots, which do not change by squaring their roots.

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375. If the equation $(a^2+b^2)x^2-2(ac+bd)x+c^2+d^2=0$ has equal roots, then

(a)$ab=cd$ (b) $ad=bc$ (c) $ad=\sqrt{bc}$ (d)$ab=\sqrt{cd}$

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376. If the sum of the roots of the equation $x^2-x=\lambda(2x-1)$ is zero, then $\lambda=$

(a) -2 (b) 2 (c) $-\frac{1}{2}$ (d) $\frac{1}{2}$

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377. If $x = 1$ is a common root of $ax^2 + ax + 2 = 0$ and $x^2 + x + b = 0$ then, $ab =$

(a) 1 (b) 2 (c) 4 (d) 3

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378. The value of c for which the equation $ax^2 + 2bx + c = 0$ has equal roots is

(a) $\frac{b^2}{a}$ (b) $\frac{b^2}{4a}$ (c) $\frac{a^2}{b}$ (d) $\frac{a^2}{4b}$

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379. If $x^2 + k(4x + k - 1) + 2 = 0$ has equal roots, then $k =$

(a) $-\frac{2}{3}, 1$ (b) $\frac{2}{3}, -1$ (c) $\frac{3}{2}, \frac{1}{3}$ (d) $-\frac{3}{2}, -\frac{1}{3}$

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380. If the sum and product of the roots of the equation $kx^2 + 6x + 4k = 0$ are equal, then , k =

(a) $-\frac{3}{2}$ (b) $\frac{3}{2}$ (c) $\frac{2}{3}$ (d) $-\frac{2}{3}$

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381. If $\sin\alpha$ and $\cos\alpha$ are the roots of the equation $ax^2 + bx + c = 0$, then $b^2 =$

(a)$a^2 - 2ac$ (b) $a^2 + 2ac$ (c) $a^2 - ac$ (d) $a^2 + ac$

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382. If 2 is a root of the equation $x^2 + ax + 12 = 0$ and the quadratic equation $x^2 + ax + q = 0$ has equal roots, then $q =$

(a) 12 (b) 8 (c) 20 (d) 16

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383. If the sum of the roots of the equation $x^2 - (k + 6)x + 2(2k - 1) = 0$ is equal to half of their product, then $k =$ (a) 6 (b) 7 (c) 1 (d) 5

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384. If a and b are roots of the equation $x^2 + ax + b = 0$, then $a + b =$

(a) 1 (b) 2 (c) -2 (d) -1

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385. A quadratic equation whose one root is 2 and the sum of whose roots is zero, is

(a)$x^2 + 4 = 0$ (b) $x^2 - 4 = 0$ (c) $4x^2 - 1 = 0$ (d) $x^2 - 2 = 0$

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386. If one root of the equation $ax^2 + bx + c = 0$ is three times the other, then $b^2 : ac =$

(a)$3 : 1$ (b) $3 : 16$ (c) $16 : 3$ (d) $16 : 1$

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387. If one root of the equation $2x^2 + kx - 6 = 0$ is 2, then the other root is

(a) 6 (b) -6 (c) -1 (d) 1

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388. If one root of the equation $x^2 + ax + 3 = 0$ is 1, then the other root is

(a)3 (b) -3 (c) 2 (d) -2

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389. If 1 is a common root of the equations $ay^2 + ay + 3 = 0$ and $y^2 + y + b = 0$,then find the value of ab.

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390. The values of k for which the quadratic equation $16x^2 + 4kx + 9 = 0$ has real and equal roots are

(a)$6, \ -\frac{1}{6}$ (b) $36, \ -36$ (c) $6, \ -6$ (d) $\frac{3}{4}, \ -\frac{3}{4}$

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