



# MATHS

**BOOKS - OSWAAL PUBLICATION**

**MATHS (KANNADA ENGLISH)**

**QUADRATIC EQUATIONS**

**Topic 1 Roots Of The Equations Multiple Choice  
Question**

1. The solution for the equations

$x + y = 10$  and  $x - y = 2$  are

A.  $x = 6$   
 $y = 4$

B.  $x = 4$   
 $y = 6$

C.  $x = 7$   
 $y = 3$

D.  $x = 9$   
 $y = 2$

**Answer: A**



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2. One root of the equation  $x^2 - 5x + k = 0$  is 2. Then  $k$  is :

A.  $-6$

B.  $6$

C.  $5$

D.  $5$

**Answer: B**



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3. If the discriminant of quadratic equations

$b^2 - 4ac = 0$  then the roots are:

A. Real and distinct

B. Roots are equal

C. No real roots

D. Roots are unequal and irrational

**Answer: B**



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4. The roots of the quadratic equations

$$x^2 - 5x - 6 = 0 \text{ are}$$

A.  $-3$  and  $-2$

B.  $3$  and  $2$

C.  $6$  and  $-1$

D.  $-6$  and  $1$

**Answer: C**



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5. The roots of the quadratic equations

$$ax^2 + bx = 0 \text{ are:}$$

A.  $0, -\frac{b}{a}$

B.  $0, +\frac{b}{a}$

C.  $+\frac{b}{a}, -\frac{b}{a}$

D.  $-\frac{b}{a}, -\frac{b}{a}$

**Answer: A**



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6. If  $4x = \frac{81}{x}$ , then the value of x is :

A.  $-4, 5$

B.  $\pm 4.5$

C.  $4.5$

D.  $\pm 0.45$

**Answer: B**



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7. In the equations  $ax^2 + bx + c = 0$ , if one roots is negative of the other then:

A.  $a = 0$

B.  $b = 0$

C.  $c = 0$

D.  $a = c$

**Answer: B**



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8. If one of the roots of the equations  $x^2 - 5x = 0$  is zero then the other roots is :

A. 0

B.  $-5$

C.  $+5$

D.  $\pm 5$

**Answer: C**



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9. If  $4a = \frac{36}{a}$ , the value of  $a$  is

A.  $\pm 9$

B.  $\pm 3$

C.  $+ 3$

D.  $- 3$

**Answer: B**



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10. The roots of a quadratic equations  $2k^2 - 2k - 5 = 0$  when the values of the coefficient a,b and c are being substituted in the formula , are

$$\text{A. } k = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(2)(5)}}{2}$$

$$\text{B. } k = \frac{- \pm \sqrt{(-2)^2 - 4(2)(-5)}}{2(2)}$$

C.

$$k = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(2)(-5)}}{2(2)}$$

$$\text{D. } k = \frac{2 \pm \sqrt{(2)^2 - 4(2)(5)}}{2(2)}$$

**Answer: C**



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**11.** The graph of  $y = x^2$  and  $y = 2 - x$  intersects at (1,1) and (-2,4) then the roots of required quadratic equations are:

A. 2 and 2

B. 1 and -2

C. 0 and -2

D. 0 and 4

**Answer: B**



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**12.** If  $a^2 = b^2 + c^2$ , then  $c$  is given by

A.  $+ - \sqrt{b^2 + a^2}$

B.  $\pm \sqrt{a^2 + b^2}$

C.  $\pm \sqrt{a - b}$

D.  $\pm \sqrt{a^2 - b^2}$

**Answer: D**



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13. One of the positive roots of the equations

$$(2x - 7)(3x - 5) = 0$$

A.  $\frac{7}{2}$

B.  $\frac{2}{7}$

C.  $\frac{3}{5}$

D.  $\frac{5}{7}$

**Answer: A**



14. Value of  $x$  in the equations

$$px^2 + qx + r = 0 \text{ is :}$$

A.  $\frac{-q \pm \sqrt{p^2 - 4pq}}{2p}$

B.  $\frac{-q \pm \sqrt{q^2 - 4pr}}{2p}$

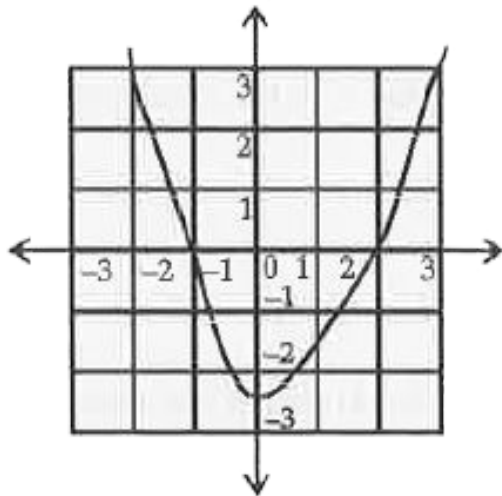
C.  $\frac{-q \pm \sqrt{r^2 - 4pq}}{2r}$

D.  $\frac{-q \pm \sqrt{p^2 - 4pq}}{2p}$

**Answer: B**



15. The roots of the quadratic equations solved in this graphs are:



A.  $+2, -1$

B.  $-2, +1$

C.  $+2, +1$



D.  $-2, -1$

**Answer: A**



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## Topic 1 Roots Of The Equations Very Short Answer Type Questions

1. For the equations  $143 = x^2 - 1$ , find the value of  $x$ .



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2. If  $r^2 = l^2 + d^2$ , then find an expression for d.



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3. If  $7y = \frac{35}{y}$ , then find the value of y .



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**Topic 1 Roots Of The Equations Very Short Answer Type Questions**

1. Five years ago , Gouri was thrice as old as Ganesh Ten years later Gouri will be twice as old as Ganesh . How old are Gouri and Ganesh.



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2. Solve the equation  $x^2 - 12x + 27 = 0$  by using formula.



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3. Find the value of the discriminant of the quadratic equation  $2x^2 - 4x + 3 = 0$



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4. If  $\frac{3x - 4}{\sqrt{3x} + 2} = 2 + \frac{\sqrt{3x} - 2}{2}$ , then find

the value of x



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5. Solve by using formula method

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



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6. The length of a rectangular playground is 2 m longer than its breadth. If the area of the playground is 195 sq. m, find the length and breadth of the field.



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7. Find the roots of the quadratic equation

$$x^2 + 7x + 12 = 0$$



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8. Solve  $x^2 + 6x - 7 = 0$  by the method of completing the square.



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9. Solve the equation by using formula:

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



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10. Solve by using formula

$$: 15m^2 - 11m + 2 = 0$$



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11. Solve by using the formula  $2y^2 + 6y = 3$ .



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**12.** Solve the equations by using the formula :

$$m^2 - 2m = 2.$$



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**13.** The length of a rectangular field is 6 times its breadth. If the area of the field is  $150m^2$ . Find its length.



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14. Solve the equations  $p^2 + 1 = 8p'$  using the formula.



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15. Solve for  $x$ :  $2(x^2 - 1) = x(1 - x)$



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**16.** Solve the equation  $x^2 - 5x + 3 = 0$  by using the formula .



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**17.** The height of a triangle is 5cm less than the base. If the area of the triangle is 150 sq. cm , find the base.



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18. Solve that  $(x - 4)(x + 4) = 6x$



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19. If  $B = \frac{\sqrt{3}a^2}{4}$ , Solve for 'a' and also find the value of 'a' if  $B = 16\sqrt{3}$



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20. Solve the quadratic equations by factorisation method:



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## Topic 1 Roots Of The Equations Long Answer Type Question I

1. Shweta takes 6 days less , than the Ankitha to complete the work. The same work is completed together in 4 days. How many days required to complete the work by Ankitha alone?



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2. A concave polygon has 44 diagonals .find the number of sides of the polygon.



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3. Aniruddha bought some books for ` rupees 60 . He had bought 5 more books for the same amount ,each books would have cost him 1 rupees ,less than . Find the number of books bought by Aniruddha.



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4. The ages of Kavya and Karthik are 11 years and 14 years respectively. In how many years will the product of their ages will be 304 ?



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5. The age of a man is twice the square of the age of his son . After eight years , the age of the man will be 4 years more than three times the age of his son. Find their present age.



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6. Mohan had brought certain number of books for rupees 48, If he had bought 4 more for the same amount , then the cost of each book would have been reduced by 1 rupee . Find the number of books bought by him.



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7. Three numbers are in the ratio  $\frac{1}{3} : \frac{1}{5} : \frac{1}{6}$  . If the sum of their squares is 644 , find the

numbers.



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**8.** If the sum of two numbers is 18 and the sum of their squares is 290, Find the numbers



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**9.** A motor boat , whose speed is 15 km /hr in still water goes 30 km down stream and comes



in a total of 4 hours 30 minutes . Determine the speed of the stream



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10. Solve the equation by using formula

$$x^2 - 8x + 1 = 0 .$$



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11. By selling an article for rupees 18.74 a dealer loses as much percent as its cost price .

Find the cost price of the article.



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**12.** the perimeter of a right angled triangle is 30 cm and its hypotenuse is 13cm . Find the length of the other two sides.



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**13.** If the square of number is added to 3 times the number , the sum is 28. Find the number.



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14. Solve :  $\frac{4}{m+2} - \frac{1}{m+3} = \frac{4}{2m+1}$



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15. The base of a triangle is 4 cm , longer than its altitude . If the area of the triangle is 48 sq. cm Find the altitude.



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**16.** Solve the following quadratic equation by using the formula method:

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



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**17.** Find two consecutive positive odd numbers such that the sum of their squares is equal to 130 .



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18. Find the whole number such that four times the number subtracted from three times the square of the number makes 15.



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## Topic 1 Roots Of The Equations Long Answer Type Question Ii

1. Solve graphically  $x^2 - 5x + 6 = 0$



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2. Solve the quadratic equation

$$x^2 + x - 6 = 0 \text{ graphically.}$$



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3. A man travels a distance of 196 km by train and returns in a car which travels at a speed of 21 km/hours more than the train if the total journey takes 11 hour. Find the average speed of the train and the car respectively.



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4. Solve graphically  $x^2 - 3x - 10 = 0$



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5. Solve graphically :  $2x^2 - x - 3 = 0$



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6. Solve graphically:  $x^2 - x - 2 = 0$



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7. Draw the graph of  $y = x^2$  and  $y = x + 2$

and hence solve the equation :

$$x^2 - x - 2 = 0$$



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8. The perimeter of a rectangle is 36 cm and its area is 80 square cm. Find its length and breadth.



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9. A sailor can row a boat 8 km downstream and return back to the starting point in 1 hr. 40 min. If the speed of the stream is 2 km/hr, find the speed of boat in still water. Answer



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**Topic 2 Relation Between Roots And Its Coefficients And Formation Of Equations Multiple Choice Questions**

1. The sum of the roots of the quadratic equations  $ax^2 + bx + c = 0$  is

A.  $\frac{c}{a}$

B.  $\frac{b}{a}$

C.  $-\frac{b}{a}$

D.  $\frac{a}{c}$

**Answer: c**



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2. The product of two consecutive natural numbers is 12. the form of this statement is :

A.  $x^2 + 2x - 12 = 0$

B.  $x^2 + x - 12 = 0$

C.  $x^2 + x + 12 = 0$

D.  $x^2 + 2x + 12 = 0$

**Answer: b**



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3. The pure quadratic equations in the following is

A.  $x + \frac{1}{x} = 4$

B.  $x + \frac{1}{x} = 0$

C.  $x - \frac{3}{4} = 2x$

D.  $3x(x - 1) = 0$

**Answer: d**



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4. The quadratic equations having the roots  $(1 + \sqrt{2})$  and  $(1 - \sqrt{2})$  is

A.  $x^2 + 2x + 1 = 0$

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

C.  $x^2 - 2x - 1 = 0$

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

**Answer: c**



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5.  $x + \frac{1}{x} = 3$  is in the forms of:

A. Adfected quadratic equations

B. Pure quadratic equations

C. Linear equations

D. Simple equations.

**Answer: a**



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6. Which one of the following is not a pure quadratic equation?

A.  $x^2 + 2 = 6$

B.  $2m^2 = 72$

C.  $p^2 = 9$

D.  $K^2 = K$

**Answer: d**



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7. If  $a$  and  $b$  are the roots of the equations

$x^2 - 5x + 7 = 0$ , then value of  $ab(a + b)$  is :

A. 5

B. 25

C. 35

D. 49

**Answer: c**



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8. The sum of a number and twice its square is

78. The correct form is its equation is:

A.  $x + 2x^2 = 78$

B.  $x + (2x)^2 = 78$

C.  $x^2 + 2x = 78$

D.  $x^2 + (2x)^2 = 78$

**Answer: a**



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9. The sum of the roots of the quadratic equations  $2x^2 = 6x - 5$  is:

A.  $\frac{1}{3}$

B.  $\frac{5}{2}$

C.  $\frac{-5}{2}$

D. 3

**Answer: d**



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10. The quadratic equations whose roots are 1 and -1 is:

A.  $ax^2 - x - 1 = 0$

B.  $ax^2 - 1 = 0$

C.  $x^2 = 1$

D.  $x^2 + 1 = 0$

**Answer: c**



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11. In a quadratic equations

$ax^2 + bx + c = 0$ , If  $a = 0$  then it becomes:

- A. Pure quadratic equations
- B. Adfected quadratic equations
- C. Simple linear equations
- D. Second degree equations.

**Answer: c**



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12. The sum of a number and its square is 42. It represent the equations

A.  $x^2 + x + 42 = 0$

B.  $x^2 + x - 42 = 0$

C.  $2x^2 + x - 42 = 0$

D.  $x^2 - x - 42 = 0$

**Answer: b**



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13. When  $2m^2 = 2 - m$  is written in the standard form, then quadratic equations becomes.

A.  $2m^2 + m - 2 = 0$

B.  $2m^2 - m - 2 = 0$

C.  $2m^2 - m + 2 = 0$

D.  $2m^2 + m + 2 = 0$

**Answer: a**



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14. If  $m$  and  $n$  are roots of a quadratic equation, then the standard form of quadratic equations is:

A.  $x^2 + (m + n)x + mn = 0$

B.  $x^2 - (m + n)x - mn = 0$

C.  $x^2 + (m - n)x + mn = 0$

D.  $x^2 - (m + n)x + mn = 0$

**Answer: d**



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15. If  $m$  and  $n$  are roots of equations  $2x^2 - 6x + 1 = 0$ , then the value of  $m^2n + mn^2$  is:

A.  $\frac{3}{2}$

B.  $\frac{2}{3}$

C.  $-\frac{3}{2}$

D.  $\frac{1}{2}$

**Answer: a**



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16. Sum of a number and its reciprocal is  $5\frac{1}{5}$ .

Then the required equations is :

A.  $y^2 + \frac{1}{y} = \frac{26}{5}$

B.  $5y^2 - 26y + 5 = 0$

C.  $y^2 + \frac{1}{y} + \frac{26}{5} = 0$

D.  $5y^2 + 26y + 5 = 0$

**Answer: b**



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17. In the equations  $ax^2 + bx + c = 0$ , if  $b=0$  then the equations.

A. Adfected quadratic equations

B. Pure quadratic equations

C. Linear equations

D. Simultaneous equations.

**Answer: b**



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**18.** The length of a rectangle is 4 cm more than the breadth. The area is 60 sq. cm. This can be represented as:

A.  $x + (x + 4) = 60$

B.  $x + (x + 4) - 60 = 0$

C.  $(x + 4)x + 60 = 0$

D.  $(x + 4)x - 60 = 0$

**Answer: d**



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19. If the sum of the roots of a quadratic equations is -5 and the product is 4, the the equation is:

A.  $x^2 + 5x + 4 = 0$

B.  $x^5 - 5x + 4 = 0$

C.  $x^2 + x - 20 = 0$

D.  $x^2 - x - 20 = 0$

**Answer: a**



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20. The product of the roots of the equations  $x^2 + 5x + (k + 4) = 0$  is zero , then k is equal to

A.  $-5$

B.  $-4$

C.  $4$

D.  $5$

**Answer: b**



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21. The quadratic equations among the following is :

A.  $a^3 + 3 = 2a$

B.  $x + 5 = 10$

C.  $x + 4(x + 1) = 0$

D.  $y^2 = \frac{2}{3}$

**Answer: d**



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22. The sum and product of the roots of the quadratic equation  $4x^2 + 1 = 0$  are respectively.

A. 1 and 4

B. 0 and 1

C. 0 and  $-\frac{1}{4}$

D. 0 and  $\frac{1}{4}$

**Answer: d**



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23. The hypotenuse of a right-angled triangle is 13 cm. If one side of the remaining is 5cm greater than the other, they can be related with each other as:

A.  $x + (x + 5) = 13$

B.  $x^2 + (x^2 + 5) = 13^2$

C.  $x^2 + (x + 5)^2 = 13^2$

D.  $x^2 + (5 - x)^2 = 13^2$

**Answer: c**



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24. If the roots of a quadratic equations are 0 and  $-\frac{1}{2}$ , the equations is:

A.  $2x^2 + x = 0$

B.  $x^2 + \frac{1}{2} = 0$

C.  $2x^2 + 1 = 0$

D.  $2x^2 - x = 0$

**Answer: a**



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25. Twice the square of a number added to three times the number is equal to 65. This statement in the form of equation is:

A.  $3x^2 + 2x = 65$

B.  $2x^2 + 3x = 65$

C.  $2x^2 + 3x^2 = 54$

D.  $3x^2 + 2x^2 + 65$

**Answer: b**



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26. Select the pure quadratic equations:

A.  $2x + 5 = 13$

B.  $x^2 + 15 = 26x$

C.  $x^2 + 5x$

D.  $x^2 + 2 = 3$

**Answer: d**



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27. The roots of an equation are +2 and -2 ,then the equations is a/an:

A. Adfected quadratic equations

B. Linear equations

C. Simple linear equations

D. Pure quadratic equations

**Answer: d**



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28. The height of triangle is 4 cm more than the base. Its area is 30 sq. cm . This relations can be represented

A.  $x(x + 4) = 30$

B.  $2x(x + 4) = 40$

C.  $x(x + 4) = 15$

D.  $x(x + 4) = 60$

**Answer: d**



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**29.** If an equation has only one root , then the equations is:

A. Quadratic equations

B. Linear equations

C. Cubic equations

D. Simultaneous equations

**Answer: b**



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30. If  $m$  and  $n$  are the roots of the equations

$x^2 - 6x + 2 = 0$  then the value of  $\frac{1}{m} + \frac{1}{n}$  is

:

A. 6

B. 1.5

C. 3

D. 2

**Answer: c**



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31. The quadratic equation whose roots are  $(3 \pm \sqrt{5})$  is :

A.  $x^2 - 6x + 4 = 0$

B.  $x^2 - 3x + 5 = 0$

C.  $x^2 + 3x - 5 = 0$

D.  $x^2 + 6x + 4 = 0$

**Answer: a**



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32. The sum and product of the roots of the equations  $2x^2 = 3x$ , respectively are:

A.  $\frac{3}{2}$  and 0

B. 0 and  $\frac{3}{2}$

C.  $+\frac{15}{2}$  and 0

D. 0 and  $-\frac{15}{4}$

**Answer: a**



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**33.** If the product of the roots of the equations

$x^2 + 3x + q = 0$  is zero then  $q$  is equal to :

A. 1

B. 2

C. 3

D. 0

**Answer: d**



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**34.** Parabola is a curve obtained from:

- A. Linear equations
- B. Cubic equations
- C. Quadratic equations
- D. Simultaneous equations.

**Answer: c**



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**35.** If  $m$  and  $n$  are the roots of the quadratic equations  $x^2 - 6x + 2 = 0$ , then the value of  $(m + n)^2$  is

A. 36

B. -36

C. 2

D. -2

**Answer: a**



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## Topic 2 Relation Between Roots And Its Coefficients And Formation Of Equations Very Short Answer Type Questions

1. Form the quadratic equations whose roots are 3 and 5.



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2. Write the standard form of a quadratic equations



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3. Write the standard form of a quadratic equations  $x^2 = 2x - 3$ .



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4. Find the sum of roots of quadratic equations  $ax^2 + bx + c = 0$



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5. Write is the axis of symmetry of the graph

$$y = x^2?$$



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6. If  $m$  and  $n$  are the roots of the equations

$$x^2 - 3x + 4 = 0 \text{ then find the value of}$$

$$m^2n + mn^2$$



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7. Write the standard form of the equations

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



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8. What is the sum of the roots of the equations  $px^2 = x - 5$ ?



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9. What is the conditions for an equations of the form  $ax^2 + bx + c = 0$  to become a linear equations?



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## Topic 2 Relation Between Roots And Its Coefficients And Formation Of Equations Short Answer Type Questions

1. Find the value of  $p$  so that the equations

$4x^2 - 8px + 9 = 0$  has roots whose

difference is 4.



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2. Find the value of  $q$  so that the equations  $2x^2 - 3qx + 5q = 0$  has one root which is twice the other.



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3. If one root of the equations  $x^2 + px + q = 0$  is 3 times the other, prove

that  $3p^2 = 16q$ .



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4. If  $m$  and  $n$  are the roots of the quadratic equations  $x^2 - 3x + 1 = 0$ , then find the value of  $\frac{m}{n} + \frac{n}{m}$



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5. What is the pure quadratic equations ? Give one example.



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6. If  $m, n$  are the roots of the equations

$x^2 - 2x + 3 = 0$ . Find the value of

$$\frac{1}{m^2} + \frac{1}{n^2}$$



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7. Form the quadratic equations whose roots

are  $3 + \sqrt{2}$  and  $3 - \sqrt{2}$



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8. If  $m$  and  $n$  are the roots of the equations  $2x^2 - 4x + 1 = 0$  Find the value of  $(m + n)^2 + 4mn$ .



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9. Find the value of  $k$  so that the equation  $49x^2 - kx - 81 = 0$  has one root as the negative of the other.



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10. What is affected quadratic equations ?

Write its standard form.



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## Topic 2 Relation Between Roots And Its Coefficients And Formation Of Equations Long Answer Type Questions Ii

1. If  $p$  and  $q$  are the roots of the equations

$$x^2 - 3x + 2 = 0, \text{ find the value of } \frac{1}{p} - \frac{1}{q}$$



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2. Form the quadratic equations whose roots are the squares of the roots of the equation

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



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3. If 'm' and 'n' are the roots of the equation

$$x^2 - 6x + 2 = 0, \text{ find the value of } m^3n^2 + n^3m^2$$

:



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## Topic 3 Nature Of The Roots And Discriminants

### Multiple Choice Questions

1. If  $ax^2 + bx + c = 0$  has equal roots. Then  $c$  is equal to :

A.  $\frac{b^2}{4a}$

B.  $\frac{b^2}{2a}$

C.  $\frac{b^2}{a}$

D.  $-\frac{b^2}{4a}$



**Answer: a**



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2. The value of  $p$  for the equation

$x^2 - px + 9 = 0$  to have equal roots is:

A.  $+6$

B.  $\pm 6$

C.  $-6$

D.  $\pm 13$

**Answer: b**



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**3. The value of the discriminant of the solution**

$$4x^2 - 4x + 1 = 0 \text{ is}$$

A.  $-8$

B.  $-12$

C.  $32$

D.  $0$

**Answer: d**



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**4.** The nature of the roots of the equations

$ax^2 + bx + c = 0$  is decided by:

A.  $b^2 - 4ac$

B.  $b^2 + 4ac$

C.  $b - 4ac$

D.  $b + 4ac$

**Answer: a**



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**5. The discriminant of the quadratic equations**

$ax^2 + bx + c = 0$  is :

A.  $-\frac{b}{a}$

B.  $b^2 - 4ac$

C.  $\frac{c}{a}$

D.  $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

**Answer: b**



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**6.** If the roots of the quadratic equations  $x^2 + 4x + c = 0$  are equal then the value of  $c$  is:

A. 3

B. 4

C. 5

D. 12

**Answer: b**



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7. If the roots of the quadratic equations  $mx^2 = 6x + 1$  are equal, then the value of  $m$  is

A. 6

B. 1

C.  $-9$

D. 5

**Answer: c**



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**8.** In a quadratic equations if the value of  $b^2 - 4ac = -7$  the nature of the roots of the quadratic equations:

- A. Real and equal
- B. Real and distinct
- C. Imaginary
- D. Negative numbers

**Answer: c**



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**9.** If the roots of equations  $x^2 - mx + 16 = 0$  are equal then the value of  $m$  is:

A.  $\pm 4$

B.  $\pm 16$

C.  $\pm 2$

D.  $\pm 8$



**Answer: d**



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**10. Roots of the equation  $x^2 - 2x + 1 = 0$  are**

**:**

A. Not real

B. Distinct

C. Equal

D. Zero

**Answer: c**



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**11.** Value of discriminant factor in the equations  $2x^2 = 5x$  is :

A. 27

B. 25

C. 23

D. 10

**Answer: b**



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**12.** The nature of the roots of the equations

$$x^2 - 6x + 9 = 0 \text{ is :}$$

- A. Real and rational
- B. Real and irrational
- C. Equal
- D. Complex

**Answer: c**



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**13.** If the roots of quadratic equations are real and distinct then which of the following is correct ?

A.  $\Delta > 0$

B.  $\Delta < 0$

C.  $\Delta = 0$

D.  $\Delta \leq 0$

**Answer: a**



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## Topic 3 Nature Of The Roots And Discriminants Very Short Answer Type Questions

1. Write the 'discriminant ' of the equations

$$ax^2 + bx + c = 0$$



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2. If  $b^2 - 4ac > 0$ , then find the nature of roots of quadratic equations

$$ax^2 + bx + c = 0$$



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3. Find the value of  $k$  for which the quadratic equations  $9x^2 - 24x + k = 0$  has equal roots.



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4. What is the value of  $k$  if the equation  $x^2 + 4x + (k + 2) = 0$  has one root equal to zero .



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5. If the discriminant of a quadratic equations is less than zero then find its roots.



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## Topic 3 Nature Of The Roots And Discriminants

### Short Answer Type Questions

1. What is the nature of the roots of the quadratic equations  $ax^2 + bx + c = 0$  if:

$$b^2 - 4ac = 0$$



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2. What is the nature of the roots of the quadratic equations  $ax^2 + bx + c = 0$  if:

$$b^2 - 4ac < 0$$





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3. For what value of  $k$ , equations  $kx^2 + 6x + 1 = 0$  has equal roots ?



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4. Discuss the nature of roots of the following equations.

$$y^2 - 7y + 2 = 0$$



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5. Discuss the nature of roots of the following equations.

$$x^2 - 2x + 3 = 0$$



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6. Discuss the nature of roots of the following equations.

$$2n^2 + 5n - 1 = 0$$



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7. Discuss the nature of roots of the following equations.

$$a^2 + 4a + 4 = 0$$



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8. Discuss the nature of roots of the following equations.

$$x^2 + 3x - 4 = 0$$



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9. Discuss the nature of roots of the following equations.

$$3d^2 - 2d + 1 = 0$$



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10. Find the value of 'p' for which the quadratic equations have equal roots:

$$x^2 - px + 9 = 0$$



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**11.** Find the value of 'p' for which the quadratic equations have equal roots:

$$2a^2 + 3a + p = 0$$



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**12.** Find the value of 'p' for which the quadratic equations have equal roots:

$$pk^2 - 12k + 9 = 0$$



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**13.** Find the value of 'p' for which the quadratic equations have equal roots:

$$2y^2 - py + 1 = 0$$



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**14.** Find the value of 'p' for which the quadratic equations have equal roots:

$$(p + 1)n^2 + 2(p + 3)n + (p + 8) = 0$$



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**15.** Find the value of 'p' for which the quadratic equations have equal roots:

$$(3p + 1)c^2 + 2(p + 1)c + p = 0.$$



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**16.** For what value of m, roots of the equations

$$x^2 + mx + 4 = 0$$
 are equal?



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## Topic 3 Nature Of The Roots And Discriminants

### Long Answer Type Questions I

1. If the roots of the equations

$$(b - c)x^2 + (c - a)x + (a - b) = 0 \quad \text{are}$$

equal, then prove that  $2b = a + c$



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Textbook Corner Exercise 10 1



1. Check whether the following are quadratic equations :

$$(x + 1)^2 = 2(x - 3)$$



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2. Check whether the following are quadratic equations :

$$x^2 - 2x = (-2)(3 - x)$$



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3. Check whether the following are quadratic equations :

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



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4. Check whether the following are quadratic equations :

$$(x - 3)(2x + 1) = x(x + 5)$$



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5. Check whether the following are quadratic equations :

$$(2x - 1)(x - 3) = (x + 5)(x - 1)$$



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6. Check whether the following are quadratic equations:

$$x^2 + 3x + 1 = (x - 2)^2$$



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7. Check whether the following are quadratic equations :

$$(x + 2)^3 = 2x(x^2 - 1)$$



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8. Check whether the following are quadratic equations:

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



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**9.** Represent the following situations in the form of quadratic equations :

The area of a rectangular plot is  $528m^2$ . The length of the plot (in metres) is one more than twice its breadth. We need to find the length and breadth of the plot.



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**10.** Represent the following situations in the form of quadratic equations :

The product of two consecutive positive integers is 306. We need to find the Integers.



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**11.** Represent the following situations in the form of quadratic equations :

Rohan's mother is 26 years older than him. The product of their ages (in years) 3 years from now will be 360. We would like to find Rohan's present age.



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**12.** Represent the following situations in the form of quadratic equations :

A train travels a distance of 480 km at a uniform speed. If the speed had been 8 km/h less, then it would have taken 3 hours more to cover the same distance. We need to find the speed of the train.



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1. Find the roots of the following quadratic equations by factorisation :

$$x^2 - 3x - 10 = 0$$



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2. Find the roots of the following quadratic equations by factorisation :

$$2x^2 + x - 6 = 0$$



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3. Find the roots of the following quadratic equations by factorisation :

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



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4. Find the roots of the following quadratic equations by factorisation :

$$2x^2 - x + \frac{1}{8} = 0$$



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5. Find the roots of the following quadratic equations by factorisation :

$$100x^2 - 20x + 1 = 0$$



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6. Solve the problems.

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 124. We would like to find out how many marbles they had to start with.



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7. Solve the problems.

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 toys produced in a day . On a particular day, the total cost of production was 750 We would like to find out the number of toys produced on that day.



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8. Find two numbers whose sum is 27 and product is 182.



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9. Find two consecutive positive integers , sum of whose squares is 365.



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**10.** The altitude of a right triangle is 7 cm less than its base . If the hypotenuse is 13 cm , find the other two sides.



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**11.** 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 90 , find the number of articles profit and the cost of each article.



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## Textbook Corner Exercise 10 3

1. Find the +roots of the quadratic equations by applying the quadratic formula.

$$2x^2 - 7x + 3 = 0$$



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2. Find the +roots of the quadratic equations by applying the quadratic formula.

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



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3. Find the +roots of the quadratic equations by applying the quadratic formula.

$$4x^2 + 4\sqrt{x} + 3 = 0$$



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4. Find the +roots of the quadratic equations by applying the quadratic formula.

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



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5. Find the roots of the following quadratic equations , if they exists , by the method of completing the square.

$$2x^2 - 7x + 3 = 0$$





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6. Find the roots of the following quadratic equations , if they exists , by the method of completing the square.

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



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7. Find the roots of the following quadratic equations , if they exists , by the method of

completing the square.

$$4x^2 + 4\sqrt{3}x + 3 = 0$$



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**8.** Find the roots of the following quadratic equations , if they exists , by the method of completing the square.

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



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9. Find the roots of the following equations :

$$x - \frac{1}{x} = 3, x \neq 0$$



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10. Find the roots of the following quadratic equations

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



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**11.** The sum of the reciprocals of Rehman's ages , (in years) 3 years ago and 5 years from now is  $\frac{1}{3}$  . Find his present age .



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**12.** In a class test, the sum of Shefali's 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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**13.** The diagonal of a rectangular field is 60 meters more than the shorter side. If the longer side is 30 meters more than the shorter side, find the side of the field.



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**14.** The difference of squares of two number is 180. The square, of smaller number is 8 times the larger number find the two number.



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**15.** A train travels 360 km at a uniform speed. If the speed had been 5 km /h more, it would have taken 1 hour less for the same journey. Find the speed of the train.



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**16.** 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 in the tank.



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**17.** 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  $11\text{km/h}$  more than that of the passenger train , find the average speed of the two trains.



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**18.** Sum of the areas of two squares is  $468\text{m}^2$  .

If the difference of their perimeters is  $24\text{m}$  ,

Find the sides of the two squares.





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## Textbook Corner Exercise 10 4

1. Find the nature of the roots of the following quadratic equation . If the real roots exists , find them.

$$2x^2 - 3x + 5 = 0$$



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2. Find the nature of the roots of the following quadratic equation . If the real roots exists , find them.

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



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3. Find the nature of the roots of the following quadratic equation . If the real roots exists , find them.

$$2x^2 - 6x + 3 = 0$$





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4. Find the value of  $k$  for each of the following quadratic equations , so that they have two equal roots.

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



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5. Find the value of  $k$  for each of the following quadratic equations , so that they have two

equal roots.

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



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6. 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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7. Is the following situation possible? If so, 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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8. Is it possible to design a rectangular park of perimeter 80 m and area  $400m^2$ ? If so, find its length and breadth.





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