

MATHS

BOOKS - BAL BHARTI

QUADRATIC EQUATIONS

Solved Example

1. Decide which of the following are quadratic equations ?

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



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2. Decide which of the following are quadratic equations ?

$$9y^2 + 5 = 0$$



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3. Decide which of the following are quadratic equations ?

$$m^3 - 5m^2 + 4 = 0$$



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4. Decide which of the following are quadratic equations ?

$$(l + 2)(l - 5) = 0$$



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5. $2x^2 - 7x + 6 = 0$ check whether

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



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6. Determine whether $x = -2$ is a root of the quadratic equation $2x^2 - 7x + 6 = 0$



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7. Solve the following quadratic equations by factorisation

$$m^2 - 14m + 13 = 0$$



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8. Solve the following quadratic equations by factorisation

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



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9. Solve the following quadratic equations by factorisation

$$3y^2 = 15y$$



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10. Solve the following quadratic equations by factorisation

$$x^2 = 3$$



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11. Solve the following quadratic equations by factorisation

$$6\sqrt{3}x^2 + 7x = \sqrt{3}$$



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12. Solve using quadratic formula : $5x^2 - 4x - 3 = 0$



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13. Solve following quadratic equations by completing the square method.

(i) $x^2 + 8x - 48 = 0$.

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14. Solve quadratic equations using formula.

$$m^2 - 14m + 13 = 0$$

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15. Solve the following quadratic equations equation by using formula.

(xii) $x^2 + 10x + 2 = 0$.

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16. Solve the following quadratic equations by using formula.

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



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17. Solve the following quadratic equations by using formula.

(viii) $25x^2 + 30x + 9 = 0$.



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18. Solve the following quadratic equations equation by using formula.

(iv) $x^2 + x + 5 = 0$.

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19. Find the value of the discriminant of the equation

$$x^2 + 10x - 7 = 0$$

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20. Determine the nature of roots of the quadratic

equation: $2x^2 - 5x + 7 = 0$

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21. Determine the nature of roots of the quadratic equation: $x^2 + 2x - 9 = 0$

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22. Determine the nature of roots of the quadratic equation: $\sqrt{3}x^2 + 2\sqrt{3}x + \sqrt{3} = 0$

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23. If α and β are the roots of the quadratic equation $2x^2 + 6x - 5 = 0$, then find $(\alpha + \beta)$ and $\alpha \times \beta$.

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24. The difference between the roots of the equation

$$x^2 - 13x + k = 0 \text{ is } 7, \text{ find } k.$$



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25. If α and β are the roots of quadratic equation

$$x^2 + 5x - 1 = 0 \text{ then, find } \alpha^3 + \beta^3$$



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26. If α and β are the roots of quadratic equation

$$x^2 + 5x - 1 = 0 \text{ then, find } \alpha^2 + \beta^2$$



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27. Obtain the quadratic equation if roots are -3 , -7 .



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28. There is a rectangular onion storehouse in the farm of Mr. Ratnakarrao at Tivasa. The length of rectangular base is more than its breadth by 7m and diagonal is more than length by 1 m. Find length and breadth of the storehouse.



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29. Solve the following questions.

(ii) A train travels 360 km with uniform speed. The speed of the train

is increased by 5km/hr , it takes 48 minutes less to cover the same distance. Find the initial speed of the train.

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Practice Set 2 1

1. Write any two quadratic equations.

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2. Decided which of the following are quadratic equations.

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

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3. Decided which of the following are quadratic equations.

$$(ii) y^2 = 5y - 10$$



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4. Decided which of the following are quadratic equations.

$$(iii) y^2 + \frac{1}{2} = 2.$$



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5. Decided which of the following are quadratic equations.

$$(iv) x + \frac{1}{x} = -2.$$



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6. Decided which of the following are quadratic equations ?

(iii) $(l + 2)(l - 5) = 0$



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7. Decided which of the following are quadratic equations.

(vi) $m^3 + 3m^2 - 2 = 3m^3$.



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8. Write the following equations in the form of

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

then write the values of a,b,c for each equation.

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



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9. Write the following equations in the form of

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

then write the values of a,b,c for each equation.

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



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10. Write the following equations in the form of

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

then write the values of a,b,c for each equation.

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

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11. Write the following equations in the form of

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

then write the values of a,b,c for each equation.

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

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12. Write the following equations in the form of

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

then write the values of a,b,c for each equation.

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



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13. Write the following equations in the form of

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

then write the values of a,b,c for each equation.

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



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14. Determine whether the value given against each of the quadratic equation are the roots of the equation.

(iii) $x^2 + 3x - 4 = 0$, $x = 1, -2, -3$.



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15. Determine whether the value given against each of the quadratic equation are the roots of the equation.

(ii) $2m^2 - 5m = 0$, $m = 2, \frac{5}{2}$.



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16. Find k if $x=3$ is a root of equation $kx^2 - 10x + 3 = 0$



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17. One of the roots of the quadratic equation $5m^2 + 2m + k = 0$ is $-\frac{7}{5}$. Complete the following

activity to find the value of k .



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Practice Set 2 2

1. Solve the following quadratic equation by factorisation.

(i) $x^2 - 15x + 54 = 0$.



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2. Solve the following quadratic equation by factorisation.

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



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3. Solve the following quadratic equation by factorisation.

$$(v) 2x^2 - 2x + \frac{1}{2} = 0.$$



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4. Solve the following quadratic equation by factorisation.

$$(iv) 5m^2 = 22m + 15.$$



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5. Solve the following quadratic equation by factorisation.

$$(v) 2x^2 - 2x + \frac{1}{2} = 0.$$



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6. Solve the following quadratic equation by factorisation.

$$(vi) 6x - \frac{2}{x} = 1.$$



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7. Solve the following quadratic equations by factorisation method:

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$\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$ by factorisation method:



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8. Solve the following quadratic equation by factorisation.

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

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9. Solve the following quadratic equations by factorization.

$$2m(m - 24) = 50$$

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10. Solve the following quadratic equation by factorisation.

(iv) $5m^2 = 22m + 15$.

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11. Solve the following quadratic equation by factorisation.

(xi) $7m^2 = 21m$.

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12. Solve the following quadratic equation by factorisation.

(xi) $7m^2 = 21m$.

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Practice Set 2 3

1. Solve the following quadratic equation by completing the square method.

(4) $9y^2 - 12y + 2 = 0$

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2. Solve the following quadratic equation by completing the square method.

$$(4) 9y^2 - 12y + 2 = 0$$

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3. Solve the following quadratic equation by completing the square method.

$$(4) 9y^2 - 12y + 2 = 0$$

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4. Solve the following quadratic equation by completing the square method.

$$(4) 9y^2 - 12y + 2 = 0$$



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5. Solve the following quadratic equation by completing the square method.

$$(4) 9y^2 - 12y + 2 = 0$$



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6. Solve the following quadratic equation by completing the square method: $5x^2 = 4x + 7$



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Practice Set 2 4

1. Compare the given quadratic equation to the general form and write values of a, b, c: $x^2 - 7x + 5 = 0$



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2. Compare the given quadratic equation to the general form and write values of a, b, c: $2m^2 = 5m - 5$



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3. Compare the given quadratic equation to the general form and write values of a, b, c: $y^2 = 7y$.





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4. Solve using formula.

(i) $x^2 + 6x + 5 = 0$



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5. Solve using formula.

(i) $x^2 + 6x + 5 = 0$



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6. Solve using formula.

(i) $x^2 + 6x + 5 = 0$





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7. Solve using formula.

(i) $x^2 + 6x + 5 = 0$



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8. Solve using formula.

(i) $x^2 + 6x + 5 = 0$



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9. Solve using formula.

(i) $x^2 + 6x + 5 = 0$





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10. With the help of the flow chart below solve the equation $x^2 + 2\sqrt{3}x + 3 = 0$ using the formula.



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Practice Set 2 5

1. Find the value of discriminant.

(i) $x^2 + 7x - 1 = 0$



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2. Find the value of discriminant.

$$(ii) 2y^2 - 5y + 10 = 0$$



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3. Find the value of discriminant.

$$(iii) \sqrt{2}x^2 + 4x + 2\sqrt{2} = 0$$



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4. Determine the nature of roots of the following quadratic equations.

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



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5. Determine the nature of roots of the following quadratic equations.

$$(ii) 2y^2 - 7y + 2 = 0$$



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6. Determine the nature of roots of the following quadratic equations.

$$(iii) m^2 + 2m + 9 = 0.$$



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7. Form the quadratic equation from the roots given below.

(i) 0 and 4



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8. Form the quadratic equation from the roots given below.

(ii) 3 and -10



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9. Form the quadratic equation from the roots given below.

(iii) $\frac{1}{2}, \frac{1}{2}$

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10. Form the quadratic equation from the roots given below.

(iv) $2 - \sqrt{5}, 2 + \sqrt{5}$

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11. Sum of the roots of a quadratic equation is double their product.

Find k if equation is $x^2 - 4kx + k + 3 = 0$.

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12. α, β are roots of $y^2 - 2y - 7 = 0$ find,

(ii) $\alpha^3 + \beta^3$.



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13. α, β are roots of $y^2 - 2y - 7 = 0$ find,

(ii) $\alpha^3 + \beta^3$.



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14. The roots of the each of the following quadratic equations are real

and equal, find k.

$$3y^2 + ky + 12 = 0$$

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15. The roots of the each of the following quadratic equations are real

and equal, find k.

$$3y^2 + ky + 12 = 0$$

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Practice Set 2 6

1. Product of Pragati's age 2 years ago and 3 years hence is 84. Find her present age.

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2. The sum of squares of two consecutive even natural numbers is 244. Find the numbers.

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3. Vivek is older than Kishor by 5 years. The sum of the reciprocals of their ages is $\frac{1}{6}$. Find their present ages.

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4. Yash scored 10 marks more in second test than that in first. 5 times the score of the second test is same as square of the score in first test. Find his score in first test.





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5. Mr. Ram makes certain number of pots on daily basis. Production cost of each pot is ₹40 more than 10 times total number of pots he makes in one day. If production cost of all pots per day is ₹600, find production cost of one pot and number of pots he makes per day.



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6. Pratik takes 8 hours to travel 36 km downstream and return to same spot. The speed of boat in still water is 12km/hr. Find the speed of the water current.



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7. Pintu takes 6 days more than those of Nishu to complete certain work. If they work together they finish it in 4 days. How many days would it take to complete the work if they work alone.



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8. If 460 is divided by a natural number, quotient is 6 more than 5 times the divisor and remainder is 1. Find quotient and divisor.



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Problem Set 2 Choose The Correct Answers

1. Which one is the quadratic equation?

A. $\frac{5}{x} - 3 = x^2$

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

C. $n - 2 = 2n$

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

Answer: B



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2. Out of the following equations, which one is not a quadratic equation? a) $x^2 + 4x = 11 + x^2$ b) $x^2 = 4x$ c)

$$5x^2 = 90 \quad \text{d) } 2x - x^2 = x^2 + 5$$

A. $x^2 + 4x = 11 + x^2$

B. $x^2 = 4x$

C. $5x^2 = 90$

D. $2x - x^2 = x^2 + 5$

Answer: A



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3. Choose the correct answer for the following questions.

(iii) The roots of $x^2 + kx + k = 0$ are real and equal, find

k.

A. 0

B. 4

C. 0 or 4

D. 2

Answer: C



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4. For quadratic equation $\sqrt{2}x^2 - 5x + \sqrt{2} = 0$, find the value of the discriminant.

A. -5

B. 17

C. $\sqrt{2}$

D. $2\sqrt{2} - 5$

Answer: B



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5. Which of the following quadratic equations has roots 3,

5? a) $x^2 - 15x + 3 = 0$ b) $x^2 - 8x + 15 = 0$ c)

$x^2 + 3x + 5 = 0$ d) $x^2 + 8x - 15 = 0$

A. $x^2 - 15x + 8 = 0$

B. $x^2 - 8x + 15 = 0$

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

D. $x^2 + 8x - 15 = 0$

Answer: B



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6. Out of the following equations, find the equation having

the sum of its roots as -5 . a) $3x^2 - 15x + 3 = 0$ b)

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

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

d)

$$3x^2 + 15x + 3 = 0$$

A. $3x^2 - 15x + 3 = 0$

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

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

D. $3x^2 + 15x + 3 = 0$

Answer: D



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7. Which of the following statement is true

- A. Real and unequal roots
- B. Real and equal roots
- C. Roots are not real
- D. Three roots

Answer: C



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8. Choose the correct answer for the following questions.

(viii) One of the roots of equation $x^2 + mx - 5 = 0$ is 2,
find m.

A. -2

B. $-\frac{1}{2}$

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

D. 2

Answer: C



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Problem Set 2

1. Which of the following equation is quadratic?

(i) $x^2 + 2x + 11 = 0$.



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2. Which of the following equation is quadratic?

(ii) $x^2 - 2x + 5 = x^2$.



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3. Which of the following equation is quadratic?

(iii) $(x + 2)^2 = 2x^2$



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4. Find the value of discriminat for each of the following equations.

(i) $2y^2 - y + 2 = 0$.

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5. Find the value of discriminat for each of the following equations.

(ii) $5m^2 - m = 0$.

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6. Find the value of discriminat for each of the following equations.

(iii) $\sqrt{5}x^2 - x - \sqrt{5} = 0$.



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7. One of the roots of quadratic equation

$2x^2 + kx - 2 = 0$ is -2 . Find k .



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8. Two roots of quadratic equations are given, frame the equation.

10 and -10



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9. Two roots of quadratic equations are given: frame the equation.

(ii) $1 - 3\sqrt{5}$ and $1 + 3\sqrt{5}$.

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10. Two roots of quadratic equations are given: frame the equation.

(iii) 0 and 7

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11. Determine the nature of roots for each of the quadratic equation.

(i) $3x^2 - 5x + 7 = 0$

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12. Determine the nature of roots for each of the quadratic equation.

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

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13. Determine the nature of roots for each of the quadratic equation.

(iii) $m^2 - 2m + 1 = 0$

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14. Solve the following quadratic equations.

(i) $\frac{1}{x+5} = \frac{1}{x^2}$

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15. Solve the following quadratic equations.

(ii) $x^2 - \frac{3x}{10} - \frac{1}{10} = 0$

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16. Solve the following quadratic equations.

(iii) $(2x + 3)^2 = 25$

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17. Solve the following quadratic equations.

(iv) $m^2 + 5m + 5 = 0$



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18. Solve the following quadratic equations.

(v) $5m^2 + 2m + 1 = 0$



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19. Determine the nature of roots of the following quadratic equations.

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



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20. Find m if $(m - 12)x^2 + 2(m - 12)x + 2 = 0$ has real and equal roots.

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21. The sum of two roots of a quadratic equation is 5 and sum of their cubes is 35. Find the equation.

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22. Find quadratic equation such that its roots are square of sum of the roots and square of difference of the roots of equation $2x^2 + 2(p + q)x + p^2 + q^2 = 0$

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23. Mukund possesses ₹50 more than what Sagar possesses. The product of the amount they have is ₹15,000. Find the amounts each one has.

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24. The difference between squares of two numbers is 120. The square of smaller number is twice the greater number. Find the numbers.

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25. Ranjana wants to distribute 540 oranges among some students. If 30 students were more, each would get 3 oranges less. Find the number of students.



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26. Mr. Dinesh owns an agricultural farm at village Talvel. The length of the farm is 10 meter more than twice the breadth. In order to harvest rain water, he dug a square shape pond inside the farm. The side of pond is $\frac{1}{3}$ times of the breadth of the farm. The area of the farm is 20 times the area of the pond. Find the length and breadth of the farm and of the pond.



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27. A tank fills completely in 2 hours if both the taps are open. If only one of the taps is open at the given time, the smaller tap takes 3 hours more than the larger one to fill the tank. How much times does each tap take to fill the tank completely?



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