MATHS

BOOKS - UNIQUE MATHS (HINGLISH)

QUADRATIC EQUATIONS

Examples

1. Solve : Decide the are quadratic equation ?

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

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2. Solve : Decide , is it quadratic equation ?

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

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3. Solve : Decide the are quadratic equation ?

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

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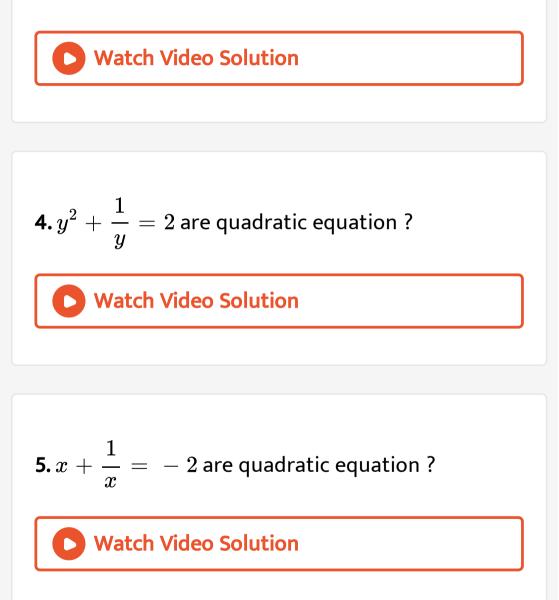**4.** Determine nature of roots of the quadratic equation : $x^2 + 2x - 9 = 0$.

Practice Set 2 1
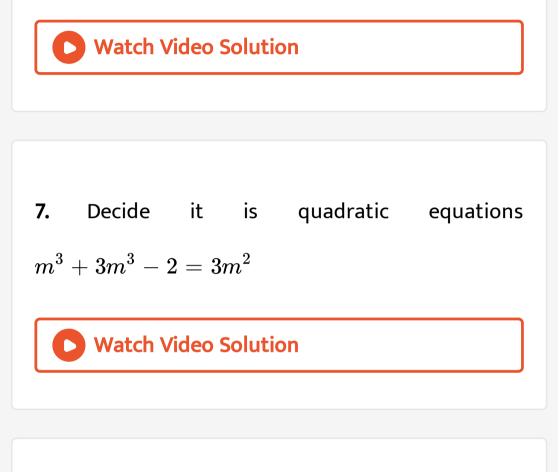
1. Write any two quadratic equations.

2. $x^2 + 5x - 2 = 0$ are quadratic equation ?

3. $y^2 = 5y - 10$ are quadratic equation ?

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4. $y^2 + \dfrac{1}{y} = 2$ are quadratic equation ?

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5. $x + \dfrac{1}{x} = -2$ are quadratic equation ?

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6. $(m + 2)(m - 2) = 0$ are quadratic equation ?

7. Decide it is quadratic equations

$$m^3 + 3m^3 - 2 = 3m^2$$

8. Write the $2y = 10 - y^2$ equation in the form $ax^2 + bx + c = 0$, then write the values of a,b,c .

9. Write the $(x - 1)^2 = 2x + 3$ equation in the form $ax^2 + bx + c = 0$, then write the values of a,b,c .

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10. Write the $x^2 + 5x = -(3 - x)$ equation in the form $ax^2 + bx + c = 0$, then write the values of a,b,c .

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11. Write the $3m^2 = 2m^2 - 9$ equation in the form $ax^2 + bx + c = 0$, then write the values of a,b,c.

12. Write the $p(3 + 6p) = -5$ equation in the form $ax^2 + bx + c = 0$, then write the values of a,b,c.

13. Write the $x^2 - 9 = 13$ equation in the form $ax^2 + bx + c = 0$, then write the values of a,b,c.

14. Determine whether the values given against each of the quadratic equations are the roots of the quadratic equation or not :

$$x^2 + 4x - 5 = 0, x = 1, \; -1$$

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

equation.

$$2m^2 - 5m = 0, m = 2, \frac{5}{2}$$

16. Find k if x=3 is a root of equation

$$kx^2 - 10x + 3 = 0.$$

17. One of the roots of equation

$$5m^2 + 2m + k = 0 \quad \text{is} \quad -\frac{7}{5}. \quad \text{Complete} \quad \text{the}$$

following activity to find the value of 'k'.

Practice Set 2 2

1. $x^2 - 15x + 54 = 0$

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

3. Solve the following quadratic equations by factorization.

$$2y^2 + 27y + 13 = 0$$

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4. Solve the following quadratic equations by factorization.

$$5m^2 = 22m + 15$$

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5. Solve the following quadratic equations by factorization.

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

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6. Solve the following quadratic equations by factorization.

$$6x - \frac{2}{x} = 1$$

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

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

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8. Solve the following quadratic equations by factorization.

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

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9. Solve the following quadratic equations by factorization.

2m(m-24)=50

10. Complete the following activity to sovle the quadratic equation $\sqrt{2x^3} + 7x + 5\sqrt{2} = 0$ by factorisation method :

$$25m^2 = 9$$

11. Solve the following quadratic equations by factorization.

$$7m^2 = 21m$$

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12. Solve the following quadratic equations by factorization.

$$m^2 - 11 = 0$$

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Practice Set 2 3

1. Solve the following quatratic equations by completing square method :

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

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2. Solve the following quatratic equations by completing square method :

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

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3. Solve the following quatratic equations by completing square method :

$$m^2 - 5m = -3$$

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

$$9y^2 - 12y + 2 = 0$$

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5. Solve the following quatratic equations by completing square method :

$$2y^2 + 9y + 10 = 0$$

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6. Solve the following quatratic equations by completing square method :

$$5x^2 = 4x + 7$$

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Practice Set 2 4

1. Compare the given quadratic equation to 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 general form and write values of a, b, c

$$2m^2 = 5m - 5$$

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3. Compare the given quadratic equation to general form and write values of a, b, c

$$y^2 = 7y$$

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4. Solve using formula.

$$x^2 + 6x + 5 = 0$$

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5. Solve using formula

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

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6. Solve the following quadratic equations by using formula method :

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

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7. Solve using formula

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

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8. Solve using formula

$$y^2 + \frac{1}{3}y = 2$$

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9. Solve using formula

$$5x^2 + 13x + 8 = 0$$

1. Find the value of discriminant.

$$x^2 + 7x - 1 = 0$$

2. Find the value of discriminant

$$2y^2 - 5y + 10 = 0$$

3. Find the value of discriminant.

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

4. Determine the nature of roots of the quadratice

equation

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

5. Determine the nature of roots of the quadratice equation

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

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6. Determine the nature of roots of the quadratice equation

$$m^2 + 2m + 9 = 0$$

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7. Form the quadratic equation if its root are 0 and 4

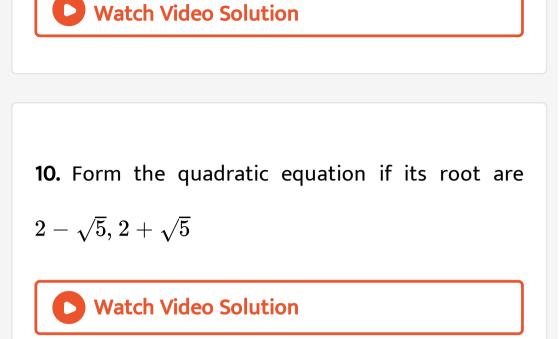**8.** Form the quadratic equation if its root are 3 and - 10

9. Form the quadratic equation if its root are $\frac{1}{2}, -\frac{1}{2}$

10. Form the quadratic equation if its root are $2 - \sqrt{5}, 2 + \sqrt{5}$

11. Sum of the roots of a quadratic equation is double their product. Find k if equation is $x^2 - 4kx + k + 3 = 0$.

12.

α, β are root of $y^2 - 2y - 7 = 0$ find $\alpha^2 + \beta^2$

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13.

α, β are root of $y^2 - 2y - 7 = 0$ find $\alpha^3 + \beta^3$

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14. The roots of the each of the following quadratic equations are real and equal, find k.

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

15. The roots of each of the following quadratic equation are real and equal , find k.
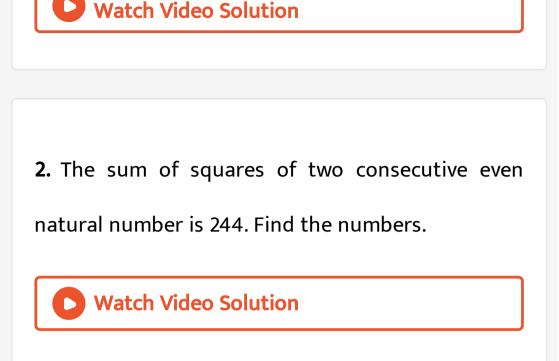
(ii)$kx(x - 2) + 6 = 0.$

Practice Set 2 6

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

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

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

4. Suyash 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.

5. Mr. Kasam runs a small business of making earthen pots. He makes certain number of pots on daily basis. Production cost of each pot is Rs. 40 more than 10 times total number of pots, he makes in one day. If production cost of all pots per day is

Rs. 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 the same spot.The speed of boat in still water is 12 km. Per hour. Find the speed of water current.

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

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

1. Which one is the quadratic equation?

A. $\dfrac{5}{x} = x^2$

B. x(x + 5) = 2

C. n - 1 = 2n

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

Answer: B

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2. Choose the correct answer for the following questions.

(ii) Out of the following equation which one is not a quadratic equation?

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

B. $x^2 = 4x$

C. $5x^2 = 90$

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

Answer: A

3. 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 $\sqrt{2}x^2 - 5x + \sqrt{2} = 0$ find the values 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. $x^2 - 15x + 8 = 0$

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. Choose the correct answer for the following questions.

(vi) Out of the following equations, find the equation having the sum of its roots -5.

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

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

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

D. N/A

Answer: B

7. Choose the correct answer for the following questions.

(vii) $\sqrt{5}m^2 - \sqrt{5}m + \sqrt{5} = 0$ which of the following statement is true for this given equation?

A. Real and unequal roots

B. Real and equal toots

C. Roots and not real

D. Three roots

Answer: C

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8. Which of the following are quadratic equations?

$x^2 + 2x + 11 = 0$

9. $x^2 - 2x + 5 = x^2$ is quadratic ?

10. Which of the following are quadratic equations?

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

11. Find the value of discriminant for

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

12. Find the value of discriminant for each of the following equations.

$$5m^2 - m = 0$$

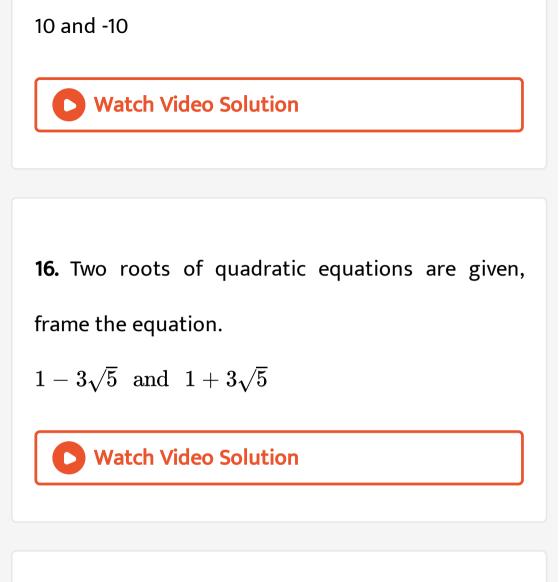**13.** Find the value of discriminant for

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

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14. One of the roots of quadratic equation

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

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15. Two roots of quadratic equations are given,

frame the equation.

10 and -10

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

$1 - 3\sqrt{5}$ and $1 + 3\sqrt{5}$

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

0 and 7

18. Determine the nature of roots for quadratic equation

$$3x^2 - 5x + 7 = 0$$

19. $\sqrt{3}x^2 - 2\sqrt{2}x - 2\sqrt{3} = 0$

20. Determine the nature of roots for each of the quadratic equations.

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

21. Solve the following quadratic equations :

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

22. Solve the following quadratic equations:

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

23. Solve the following quadratic equations:

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

24. Solve the following quadratic equations :

$$m^2 + 5m + 5 = 0$$

25. Solve the following quadratic equations :

$$5m^2 + 2m + 1 = 0$$

26. Solve the following quadratic equations :

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

27. Find m, if the quadratic equation $(m-12)x^2 + 2(m-12)x + 2 = 0$ has real and eqaul roots.

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

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

30. Mukund possesses RS 50 more than what Sagar possesses. The product of the amount they have is numerically RS 15000. Find the amount each has.

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

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32. 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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33. 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 $\dfrac{1}{3}$ 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.

34. 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?
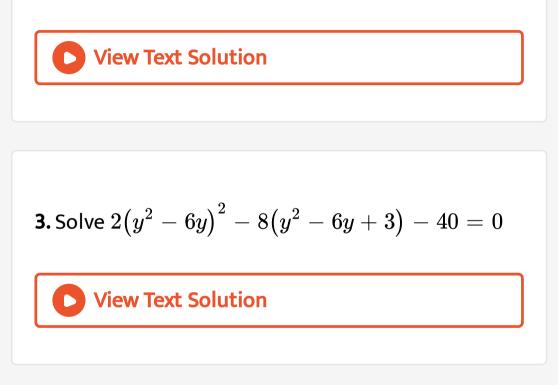
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1. A car covers a distance of 240km with some speed . If the speed is increased by 20km/hr, it will cover the same distance in 2 hours less find the speed of the car .

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2. The product of four consectuive positive integers

is 1680. find the numbers.

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3. Solve $2(y^2 - 6y)^2 - 8(y^2 - 6y + 3) - 40 = 0$

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4. Two year ago my age was $4\dfrac{1}{2}$ times the age of

my son . Six years ago, my age was twice the square

of the age of my son. What is the present age of my son ?

5. From the same place at 7am 'A' started walking in the north at the speed of 5 km/hr. after 1 hr B started cycling in the east at a speed of 16km/hr. At what time they will be a distance of 52km apart from each other ?

6. A businessman bought some items for Rs. 600. Keeping 10 items for himself he sold the remaining items at a profit of Rs. 5 per item. From the amount received in this deal he could buy 15 more items. Find the original price of each item.

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Unique Practice Session

1. Which of the following is one root of the quadratic equation $x^2 - 7x + 10 = 0$

A. 7

B. 5

C. -7

D. -1

Answer:

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2. What is nature of the roots of the quadratic

equation $9x^2 + 6x + 1 = 0$

A. Real and equal

B. Not real

C. Real and unequal

D. None of these

Answer:

3. If $\alpha = -7$ and $\beta = -3$ the quadratic equation is

A. $x^2 - 10x - 21 = 0$
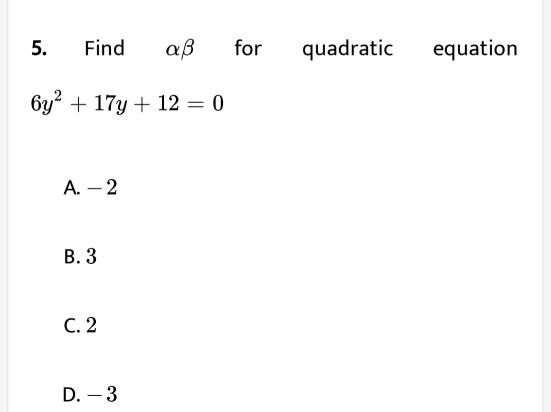
B. $x + 10x + 21 = 0$
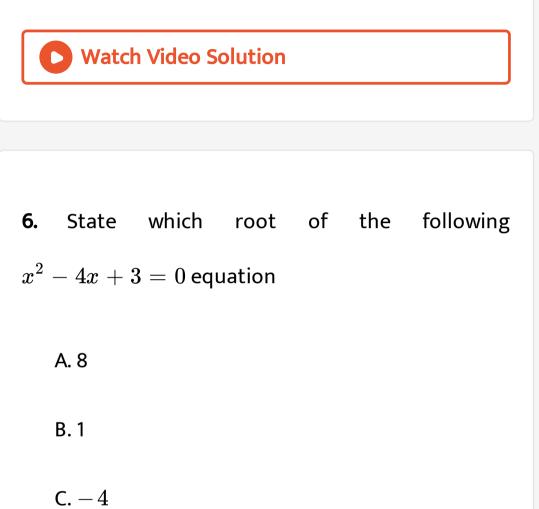
C. $x^2 = 10x + 21 = 0$

D. $x^2 + 10x - 21 = 0$

Answer:

4. $9p^2 - 5p - 4 = 0$ for this equation

$\alpha + \beta = \ldots$

A. $\dfrac{5}{9}$

B. $\dfrac{-5}{9}$

C. $\dfrac{4}{9}$

D. $\dfrac{-4}{9}$

Answer:

---

5. Find $\alpha\beta$ for quadratic equation

$6y^2 + 17y + 12 = 0$

   A. -2

   B. 3

   C. 2

   D. -3

Answer:

---

6. State which root of the following $x^2 - 4x + 3 = 0$ equation

A. 8

B. 1

C. -4

D. 0

Answer:

7. If $\alpha + \beta = -2, \alpha\beta = -35$ then quadratic equation is ....

A. $x^2 + 2x + 35 = 0$

B. $x^2 - 2x - 35 = 0$

C. $x^2 + 2x - 35 = 0$

D. $x^2 - 36 = 0$

Answer:

8. Roots of the quadratic equation are ...... for $9x^2 - 81 = 0$

    A. $-7, 6$

    B. $6, -6$

    C. $3, -3$

    D. $9, -9$

Answer:

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9. Write the given quadratic equation in standard form $x + \dfrac{1}{x} = 4$

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

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

C. $x^2 - 4x - 1 = 0$

D. $x^2 - 4x = 40$

Answer:

10. What are the roots of $x^2 + 3x + 2 = 0$

    A. $-1, \ -2$

    B. $+1, \ +2$

    C. $-1, 2$

    D. $1, \ -2$

Answer:

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11. Find values of y for equation $2y^2 + 5y - 7 = 0$

12. Find the value of a, b, c in the following quadratic equation:

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

13. Write the following quadratic equation in a standard form

$$2x(x + 7) + 5 = 0$$

14. Verify whether 1 is the root of the quadratic equation:

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

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15. Find the value of discriminant for the equation where a=b, b=-4 and c=2

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16. For one quadratic equation $\Delta = -12$ then state nature of roots for that equation

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17. For one quadratic value of discriminant is 0, then state nature of roots for that equation

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18. Find $\alpha + \beta$ and $\alpha\beta$ value for the quadratic equation has $a = 2, b = -4$ and $c = -2$

19. Find the value of $\alpha + \beta$ for the equation
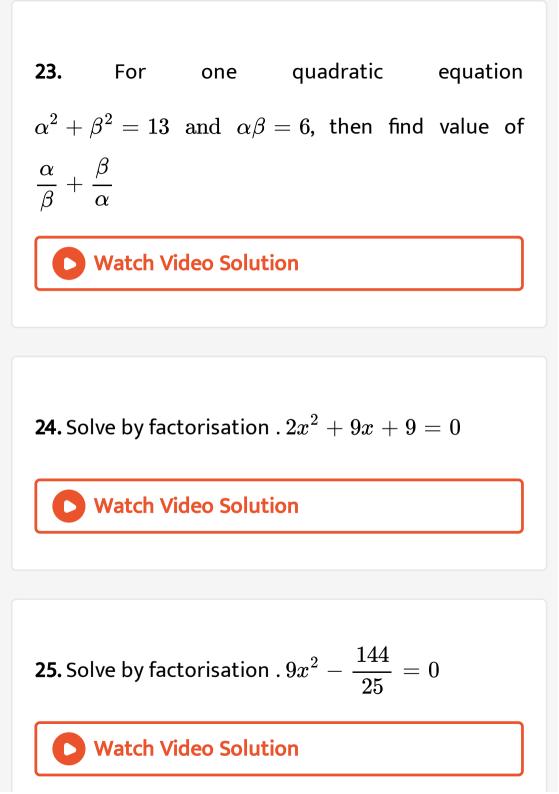
$x^2 + 8x + 12 = 0$

20. Find the value of $\alpha\beta$ for the quadratic equation

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

21. If $\alpha + \beta = 3$ and $\alpha\beta = -4$ for one quadratic equatiojn then find that quadratic equation .

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22. If for one quadratic equation $\alpha + \beta = 5$ and $\alpha\beta = 6$, then find value of $\alpha^2 + \beta^2$

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23. For one quadratic equation $\alpha^2 + \beta^2 = 13$ and $\alpha\beta = 6$, then find value of $\dfrac{\alpha}{\beta} + \dfrac{\beta}{\alpha}$

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24. Solve by factorisation . $2x^2 + 9x + 9 = 0$

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25. Solve by factorisation . $9x^2 - \dfrac{144}{25} = 0$

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26. Find the value of discriminant of

$$\sqrt{3}x^2 + 2\sqrt{2}x - 2\sqrt{3}$$

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27. If root of a quadratic equation are

$\left(3 - \sqrt{7}\right), \left(3 + \sqrt{7}\right)$ and then find the quadratic

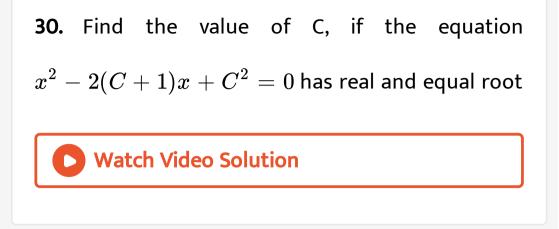equation

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28. Solve the following problems :

The product of two consecutive even natural numbers is 120. Find the numbers.

29. Write the value of a, b, c for quadratic equation

$$2z - \frac{5}{z} = z - 6$$

30. Find the value of C, if the equation $x^2 - 2(C + 1)x + C^2 = 0$ has real and equal root

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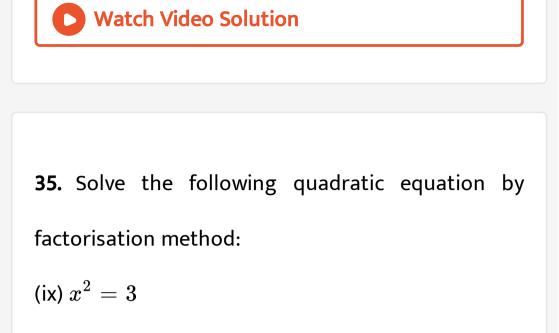**31.** $2x^2 - 7x + 6 = 0$ check whether (i) x=-2 are solution of the equation

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32. Solve the following quadratic equation by factorisation method:

(iv) $m^2 - 14m + 13 = 0$.

33. Solve the following quadratic equation by factorisation method:

(xv) $3x^2 - x - 10 = 0$.

34. Solve the following quadratic equation by factorisation method:

(viii) $3y^2 = 15y$.

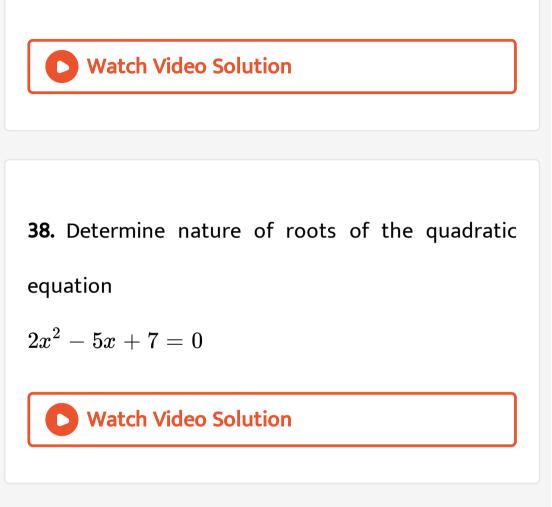**35.** Solve the following quadratic equation by factorisation method:

(ix) $x^2 = 3$

36. Find the value of the discriminant of the equation $x^2 + 10x - 7 = 0$

37. Obtain a quadratic equation whose roots are -3 and -7.

38. Determine nature of roots of the quadratic equation

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

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

(v) $\sqrt{3}x^2 + 2\sqrt{3}x + \sqrt{3} = 0.$

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

41. Solve the following quadratic equations by formula method, $x^2 - 4x + 1 = 0$

42. If $\alpha + \beta = 6$ and $\alpha^2 + \beta^2 = 72$, find a quadratic equation whose roots are α and β.

43. If root of one quadratic equation are $\left(4\sqrt{2} + 3\right)$ and $\left(4\sqrt{2} - 3\right)$ then find the quadratic equation .

44. If $\alpha = 5 + 2\sqrt{2}$ and $\beta = 5 - 2\sqrt{2}$ are the roots of the equation $x^2 - 10x + k$ then find the value of k.

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45. Solve the quadratic equation by formula method $x^2 + 2\sqrt{3}x + 3 = 0$

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46. Solve the quadratic equation by factorisation method $4z + \dfrac{6}{z} = 11$

47. The product of shabnam's age 5 years ago with her age 9 years later is 176. find the present age of shabnam

48. The sum of two numbers is 15 and sum of their reciprocals is $\dfrac{5}{18}$, find the numbers.

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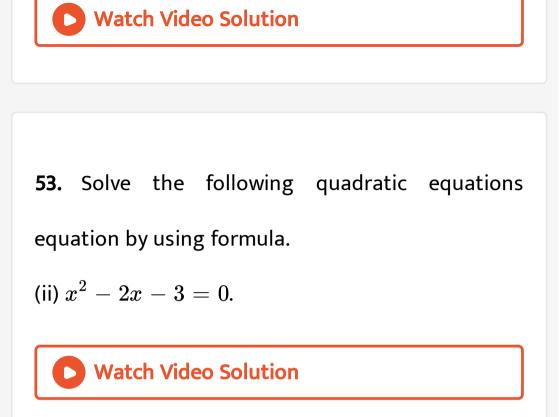**49.** A natural number is a greater than three times its squares root by 4. find the number

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50. Solve the following quadratic equation by factorisation method:

(xviii) $6\sqrt{3}x^2 + 7x = \sqrt{3}$.

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

(i) $m^2 - 14m + 13 = 0$.

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

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

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

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

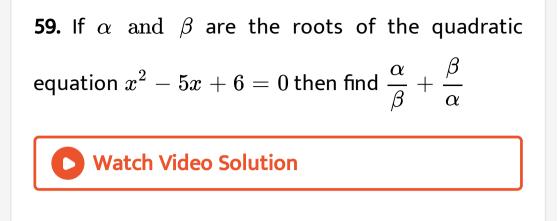**54.** Solve the following quadratic equations equation by using formula.

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

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

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

56. The difference between the roots of the equation $x^2 - 13x + k = 0 \, is \, 7$, find k.

57. If α and β are roots of $x^2 + 5x - 1 = 0$, then find $(i)\alpha^3 + \beta^3 (ii)\alpha^2 + \beta^2$

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58. If α and β are the roots of the quadratic equation $x^2 - 5x + 6 = 0$ then find `alpha^2 + beta^2

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59. If α and β are the roots of the quadratic equation $x^2 - 5x + 6 = 0$ then find $\dfrac{\alpha}{\beta} + \dfrac{\beta}{\alpha}$

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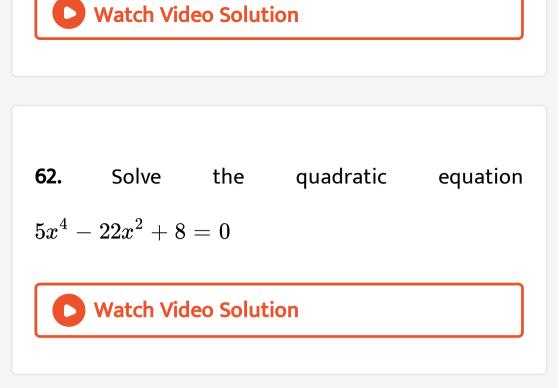**60.** The difference of roots is 9 and the sum of their square is 13. find the quadratic equation ?

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61. The sum of the squares of two consecutive odd natural numbers is 290 . Find the numbers.

62. Solve the quadratic equation

$$5x^4 - 22x^2 + 8 = 0$$

63. Three sides of right angled triangle are three consecutive even numbers. Find the hypotenuse

64. Solve the equation $(p^2 + p)(p^2 + p - 3) = 28$

65. The denominator of a fraction exceeds its numerator by 2. If one is added to both numerator and denominator, the difference between new and the original fraction is $\frac{1}{28}$. Find the original fraction with positive denominator.

66. Solve the quadratic equation $x^2 + 8x + 15 = 0$ by the method of completing square

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67. Solve $9m^2 - 12m + 2 = 0$ by the method of completing square .

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68. Solve the following equation $4y^2 + \dfrac{6}{y^2} = 11$

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69. Solve $5x^2 - 4x - 3 = 0$

70. The area of a rectangular playground is 420 sq.m. If its length is increasing by 7m and breadth is decreased by 5m, the area remains the same.Find the length and breadth of the playground.

71. Four - fifths of a number is greater than three fourths of the number by 4 find the numbers.

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72. If the cost of an apple is increased by Rs.1 per piece, then one can get 2 apples less for Rs. 840 . Find the original cost of one apple .

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73. The product of four consecutive positive integers is 840. Find the numbers.

74. The divisor and quotient of the number 6123 are same and the remainder is half the divisor. Find the divisor.

75. The difference between two positive integers is 2 and difference between their cubes is 98. find the numbers

76. 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 digonal is more than length by 1 m. Find length and breadth of the storehouse.

77. 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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Assignment

1. Out of the following equations which one is nota quadratic equation ?

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

B. $x^2 = 4x$

C. $5x^2 = 90$

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

Answer:

2. For $\sqrt{2}x^2 - 5x + \sqrt{2} = 0$ find the values of the discriminant .

A. -5

B. 17

C. $\sqrt{2}$

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

Answer:

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3. Solve the following quadratic equations by using

formula method :

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

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4. One of the roots of equation $5m^2 + 2m + k = 0$ is $-\dfrac{7}{5}$. Complete the following activity to find the value of 'k'.

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

6. A businessman bought some items for Rs. 600. Keeping 10 items for himself he sold the remaining items at a profit of Rs. 5 per item. From the amount received in this deal he could buy 15 more items. Find the original price of each item.

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