



MATHS

BOOKS - OSWAL PUBLICATION

QUADRATIC EQUATIONS

Example

1. Solve the given equation by the method of completing the

square: $x^2 + 12x - 45 = 0$



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2. Solve the following equation:

$$\frac{1}{x} - \frac{1}{x-2} = 3, x \neq 0, 2$$



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3. Solve the following quadratic equation by applying the quadratic formula $p^2x^2 + (p^2 - q^2)x - q^2 = 0$



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SELF ASSESSMENT -1 (Multiple Choice Questions:)

1. Roots of quadratic equation $x^2 - 4x + 3 = 0$ are

A. 1,3

B. 2,5

C. 1,5

D. none of the above



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2. If $x = 3$ is one root of the quadratic equations $x^2 - 2kx - 6 = 0$, then the value of k is.

A. $\frac{9}{4}$

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

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

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

Answer: B



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3. The positive root of $\sqrt{3x^2 + 6} = 9$ is

A. 3

B. 9

C. 5

D. 4



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SELF ASSESSMENT -1 (Fill in the Blank)

1. If 10 is a root of quadratic equation $11^2 - kx - 120 = 0$, then value of k is



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2. If one of the root of quadratic equation $6x^2 - x - k = 0$ is $\frac{2}{5}$, then value of k is ___



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3. The value of x, which satisfy the equation $ax^2 + bx + c = 0$ are known as ___ of the equation.



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SELF ASSESSMENT -1 (Very Short Answer Type Question:)

1. Find the value of k , for which one root of the quadratic equation $kx^2 - 14x + 8 = 0$ is 2.



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2. Find the roots of the following quadratic equation $\frac{2}{5}x^2 - x - \frac{3}{5} = 0$



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3. 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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SELF ASSESSMENT -1 (Short Answer Type Questions-I)

1. Find the roots of $x^2 - 4x - 8 = 0$ by the method of completing square.



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2. Find the value of k for which the roots of the quadratic equation $2x^2 + kx + 8 = 0$ will have the equal roots ?



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3. Find the roots of the quadratic equation $6x^2 - x - 2 = 0$.



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SELF ASSESSMENT -1 (Short Answer Type Questions-II)

1. Solve the quadratic equation $(x - 1)^2 - 5(x - 1) - 6 = 0$



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2. Find the roots of the quadratic equation:

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



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SELF ASSESSMENT -1 (Long Answer Type Questions-III)

1. Given, solve for

$$x: \left(\frac{2x}{x-5}\right)^2 + 5\left(\frac{2x}{x-5}\right) - 24 = 0, x \neq 5$$

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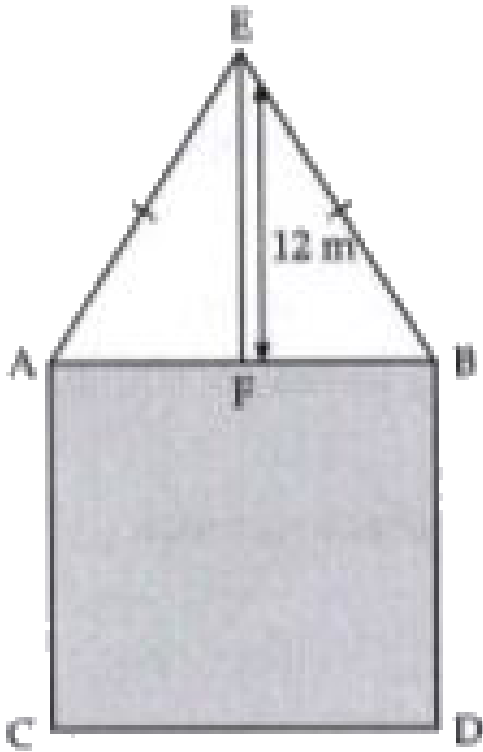
2. Solve: $x = \frac{1}{2 - \frac{1}{2 - \frac{1}{2-x}}} = 0, x \neq 2.$

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SELF ASSESSMENT -1 (Case Study Based Questions:)

1. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shape of

an isosceles triangle with its base as the breadth of the rectangular park and of altitude 12 m.



What will be the quadratic equation from given information.

A. $x^2 + 3x - 4$

B. $x^2 + 3x + 4$

C. $x^2 - 3x - 4$

D. $x^2 - 6x + 4$



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2. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the

A. 4m

B. 5m

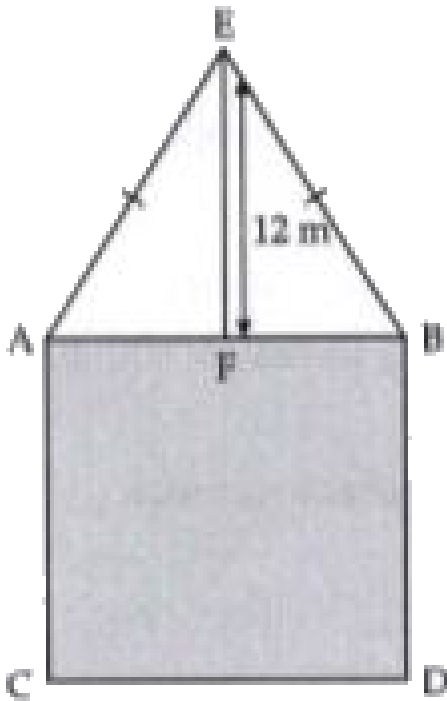
C. -4m

D. 6m



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3. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the rectangular park and of altitude 12 m.



Find the tenth of rectangular park ABCD

A. 4m

B. 6m

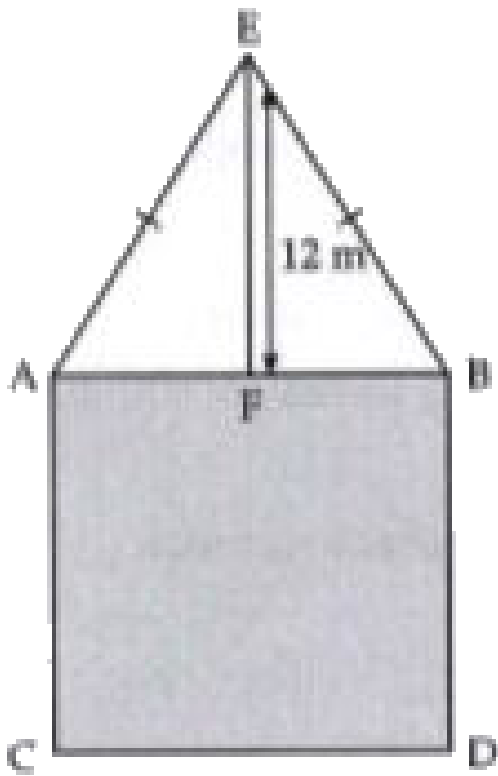
C. 2m

D. 7m



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4. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the rectangular park and of altitude 12 m.



What will be the area of rectangular park?

A. $32m^2$

B. $28m^2$

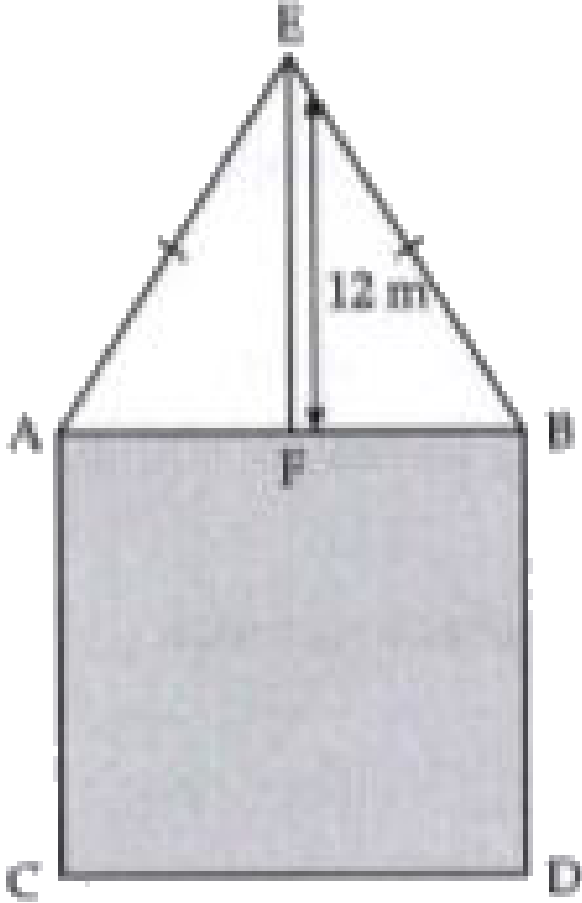
C. $25m^2$

D. $24m^2$



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5. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the rectangular park and of altitude 12 m.



What will be the area of an isosceles shaped park ?

A. $24m^2$

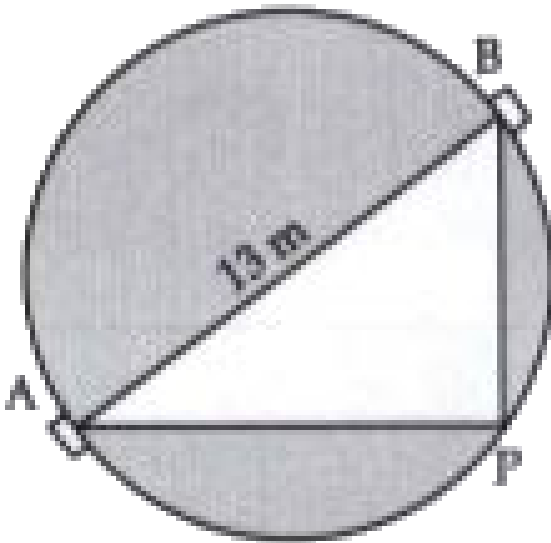
B. $28m^2$

C. $22m^2$

D. $30m^2$



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6.

In the Dwarika residency colony, there is a circular park of diameter 13 metres. A pole has to be erected at the point P on the boundary of circular park 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.

Find the quadratic equation from the given information.

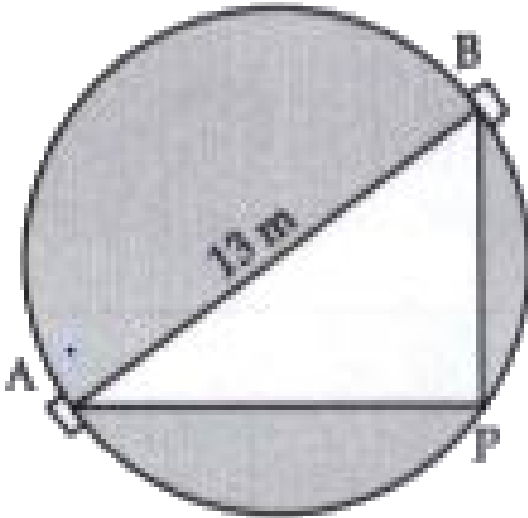
A. $x^2 - 14x - 140$

B. $x^2 + 7x - 60$

C. $x^2 + 4x - 60$

D. $x^2 - 7x + 60$

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7.

In the Dwarika residency colony, there is a circular park of

diameter 13 metres. A pole has to be erected at the point P on the boundary of circular park 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.

Find the distance of the pole from the gate A.

A. 5m

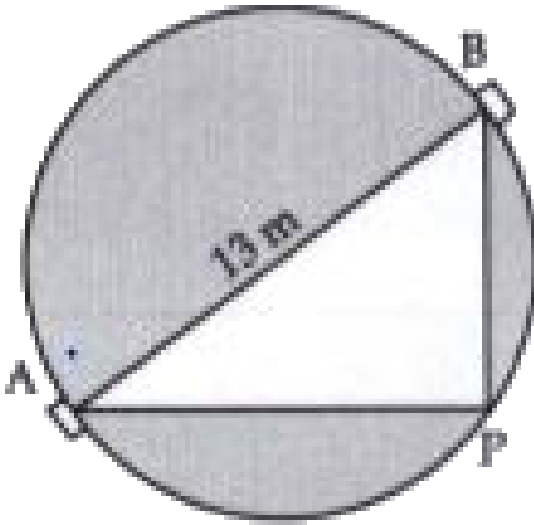
B. 7m

C. 6m

D. 12m



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8.

In the Dwarika residency colony, there is a circular park of diameter 13 metres. A pole has to be erected at the point P on the boundary of circular park 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.

Find the distance of the pole from the gate B.

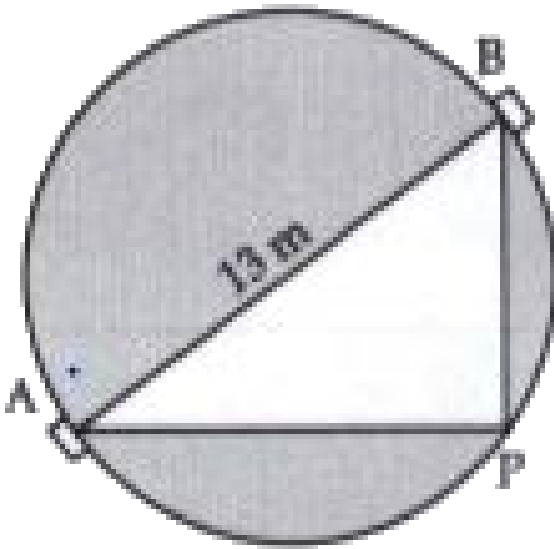
A. 5m

B. 7m

C. 6m

D. 12m

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9.

In the Dwarika residency colony, there is a circular park of diameter 13 metres. A pole has to be erected at the point P on the boundary of circular park in such a way that the difference of its distances from two diametrically opposite fixed gates A and B

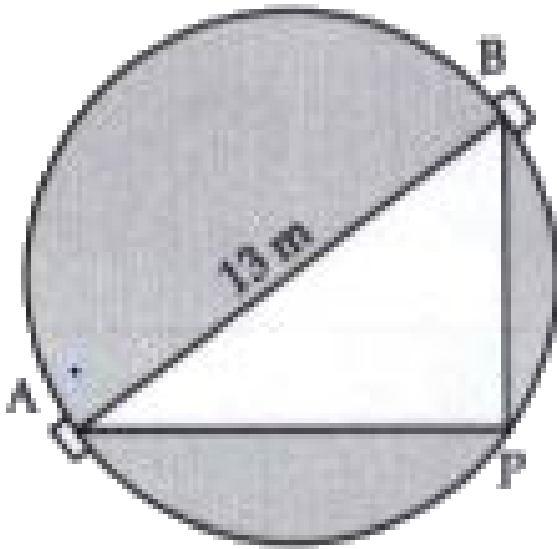
on the boundary is 7 metres.

For equation, $ax^2 + bx + c = 0$, $b^2 - 4ac$ is called the

- A. Discriminant
- B. Distinct roots
- C. Quadratic equation
- D. None of these



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10.

In the Dwarika residency colony, there is a circular park of diameter 13 metres. A pole has to be erected at the point P on the boundary of circular park 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.

In an equation does not have real roots, then it is said to be having roots.

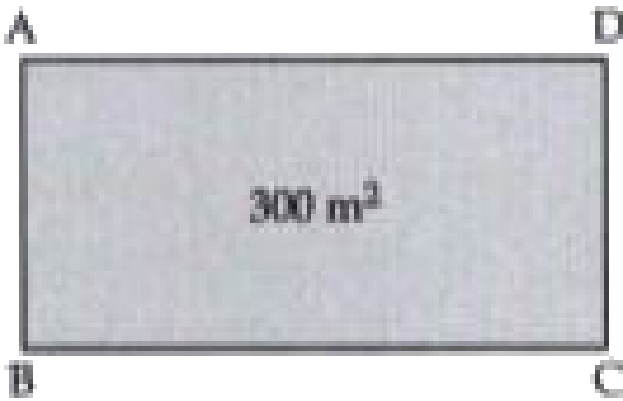
A. real

B. equal

C. imaginary

D. none of these

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A charity trust decides to build a prayer hall having a carpet area to $300m^2$ with its length one metre more than twice its breadth.

The general form of a quadratic equation is

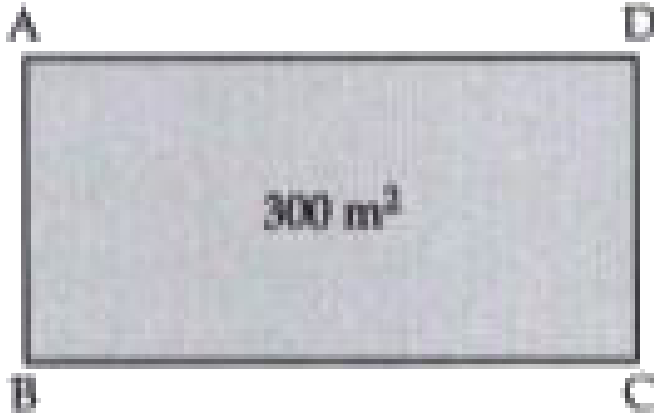
A. $ax^2 + bx = 0$

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

C. $ax + c = 0$

D. $bx^2 + ax + c$

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A charity trust decides to build a prayer hall having a carpet area to $300m^2$ with its length one metre more than twice its

breadth.

Write the quadratic equation form the given information.

A. $x^2 + 2x - 150$

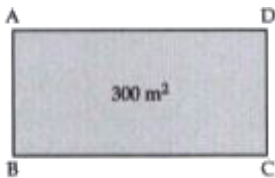
B. $2x^2 + x - 300$

C. $2x^2 - x - 300$

D. $2x^2 + x + 300$



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13.

A charity trust decides to build a prayer hall having a carpet area to 300m^2 with its length one metre more than twice its

breadth.

What is the breadth of the hall ?

A. 24 m

B. 14 m

C. 12 m

D. 13 m



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14.

A charity trust decides to build a prayer hall having a carpet area to 300m^2 with its length one metre more than twice its breadth.

When the discriminant $D = b^2 - 4ac = 0$, then the roots will be

- A. imaginary
- B. real and distance
- C. real and equal
- D. none of these



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15.

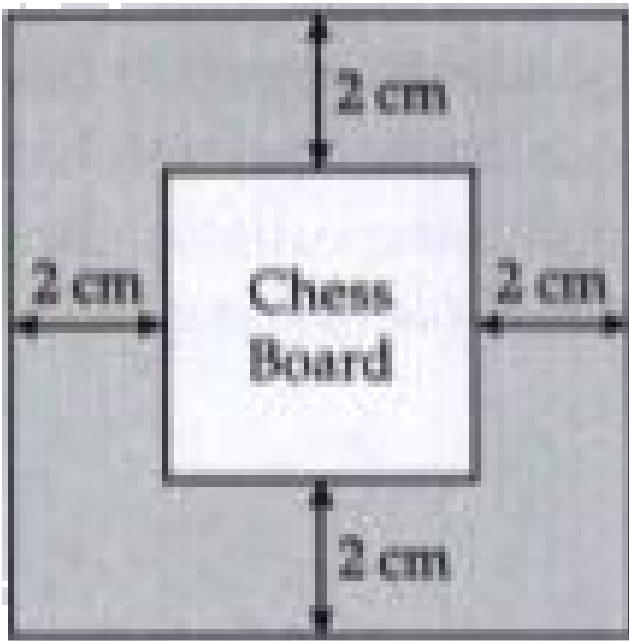
A charity trust decides to build a prayer hall having a carpet area to 300 m^2 with its length one metre more than twice its breadth.

What is the length of the hall ?

- A. 12 m
- B. 24 m
- C. 28 m

D. 25 m

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16.

Sohan and Mohan are playing a chess on Sunday. The chess board contains equal squares and the area of each equal square is 6.25cm^2 .

A border round the board is 2 cm wide.

Find the length of the side of the chess board.

A. 6 cm

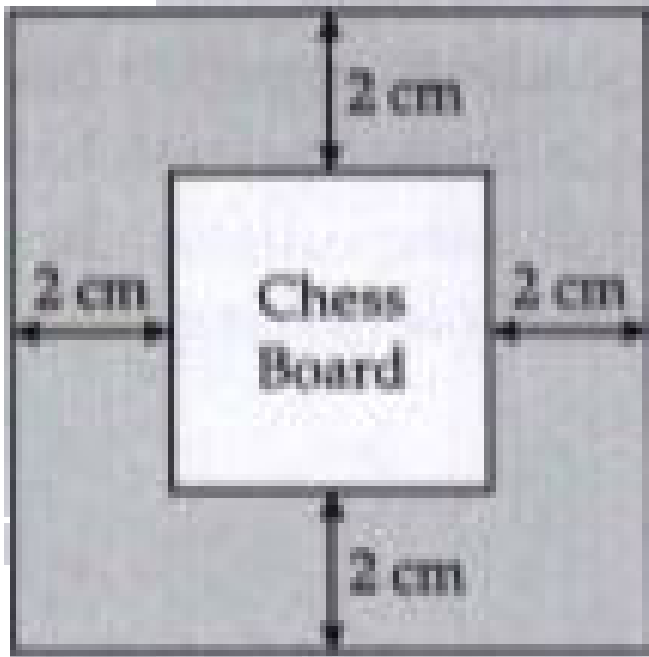
B. 12 cm

C. 48 cm

D. 24 cm



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17.

Sohan and Mohan are playing a chess on Sunday. The chess board contains equal squares and the area of each equal square is 6.25cm^2 .

A border round the board is 2 cm wide.

Find the area of the chess board.

A. 576cm^2

B. 567cm^2

C. 587cm^2

D. 560cm^2



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18. Sohan and Mohan are playing a chess on Sunday. The chess board contains equal squares and the area of each equal square is 6.25 cm^2 . A border round the board is 2 cm wide.

Find the area of 64 equal squares.

A. 300cm^2

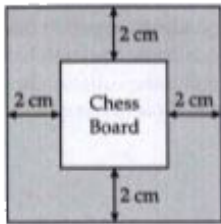
B. 400cm^2

C. 500cm^2

D. 576cm^2



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19.

Sohan and Mohan are playing a chess on Sunday. The chess board contains equal squares and the area of each equal square is $6.25m^2$.

A border round the board is 2 cm wide.

For equation $ax^2 + bx + c = 0$, $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ is

called the.....

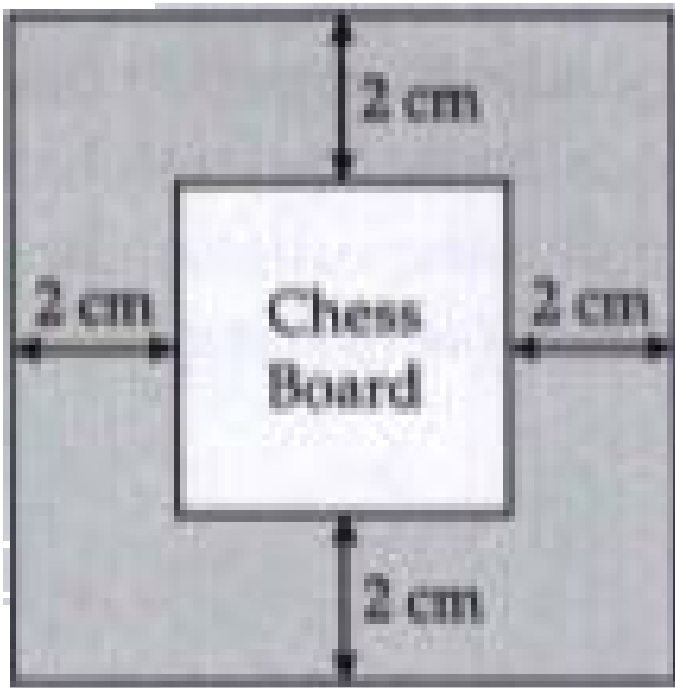
A. Quadratic formula

B. Heron's Formula

C. Pythagoras formula

D. None of these

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20.

Sohan and Mohan are playing a chess on Sunday. The chess

board contains equal squares and the area of each equal square is 6.25cm^2 .

A border round the board is 2 cm wide.

Area of border of 2 cm wide will be ?

A. 576cm^2

B. 976cm^2

C. 176cm^2

D. 276cm^2



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SELF ASSESSMENT -2 (Multiple Choice Questions:)

1. The value of p for which the quadratic equation $4x^2 + px + 3 = 0$ has equal roots are.

A. 4

B. $\pm 4\sqrt{3}$

C. $4\sqrt{3}$

D. $-4\sqrt{3}$



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2. The nature of roots of the quadratic equation $2x^2 - 4x + 3 = 0$

A. distinct real roots

B. Imaginary roots

C. equal real roots

D. None of these



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3. For what values of k , the roots of the equation

$$x^2 + 4x + k = 0 \text{ are real?}$$

A. $k \geq 4$

B. $k = 4$

C. $k = 0$

D. $k \leq 4$

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SELF ASSESSMENT -2 (Fill in the Blanks:)

1. Nature of roots of quadratic equation $4x^2 + 3x - 14 = 0$ is.....

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2. Value of k for which the quadratic equation $2x^2 + kx + 8 = 0$ have equal roots, are.....

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3. For $p = \underline{\hspace{2cm}}$ the quadratic equation $9x^2 - 3px + p = 0$ has equal roots.



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SELF ASSESSMENT -2 (Very Short Answer Type Questions:)

1. Find the value (p) of k for which the equation $x^2 + 5kx + 16 = 0$ has real and equal roots.



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2. Find the value(s) of k, if the quadratic equation $3x^2 - k\sqrt{3}x + 4 = 0$ has equal roots.



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3. For what values of k , the roots of the equation $x^2 + 4x + k = 0$ are real?

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SELF ASSESSMENT -2 (Short Answer Type Questions- I)

1. Find the nature of the roots of the quadratic equation $13\sqrt{3}x^2 + 10x + \sqrt{3} = 0$

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2. Find k so that the quadratic equation $(k + 1)x^2 - 2(k + 1)x + 1 = 0$ has equal roots.



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3. If 2 is a root of the equation $x^2 + kx + 12 = 0$ and the equation $x^2 + kx + q = 0$ has equal roots, find the value of q .



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SELF ASSESSMENT -2 (Short Answer Type Questions- II)

1. 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 4 (b) 8 (c) 12 (d) 16



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2. What is the value (s) of k for which the equation $kx^2 - kx + 1 = 0$ has equal roots?



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3. Write all the value of p for which the quadratic equation $x^2 + px + 16 = 0$ has equal roots. Find the roots of the equation so obtained.



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SELF ASSESSMENT -2 (Long Answer Type Questions)

1. 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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2. Check whether the equation $5x^2 - 6x - 2 = 0$ has real roots and if it has, find them by the method of completing the square.

Also verify that roots obtained satisfy the given equation.



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NCERT CORNER (Exercise- 4.1)

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 : (i) The area of a rectangular plot is 528 m^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 plo



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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. Rohan's mother is 26 years older than him. The product of their ages after 3 years will be 360. Express the above in the form of quadratic equation to find Rohan's present age

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12. 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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NCERT CORNER (Exercise- 4.2)

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. Represent the following situations mathematically:

(i) 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.

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 RS.750. We would like to find out the number of toys produced on that day.

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7. Represent the following situations mathematically: (i) 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

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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 to

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

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



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



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3. Find the roots of the following quadratic equations, if they exist, by the method of completing the square:(i)

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

(ii)

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

$$4x^2 + 4\sqrt{3}x + 3 = 0 \text{ (iv) } 2x^2 + x + 4 = 0$$



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4. Find the roots of the following quadratic equations, if they exist, by the method of completing the square:(i)

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

(ii)

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

$$4x^2 + 4\sqrt{3}x + 3 = 0 \text{ (iv) } 2x^2 + x + 4 = 0$$



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5. Find the roots of the quadratic equations by applying the quadratic formula.

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



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



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7. Find the roots of the quadratic equation

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

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8. Find the roots of the quadratic equations given in Question no. 1 above by applying the quadratic formula.

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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. Solve: $\frac{1}{(x+4)} - \frac{1}{(x-7)} = \frac{11}{30}$, $x \neq -4, 7$.



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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 Shefalika'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 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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14. The difference of squares of two number is 180. The square of the smaller number is 8 times the larger number. Find the two numbers.

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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 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 11km h more than



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18. Sum of the areas of two squares is $468 m^2$. If the difference of their perimeters is 24 m, find the sides of the two squares.



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NCERT CORNER (Exercise- 4.4)

1. Find the nature of the roots of the following quadratic equations. If the real roots exist, find them:(i)

$$2x^2 - 3x + 5 = 0 \text{ (ii)}$$

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

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



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2. Find the nature of the roots of the following quadratic equations. If the real roots exist, find them:(i)

$$2x^2 - 3x + 5 = 0 \text{ (ii)}$$

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

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

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3. Find the nature of the roots of the following quadratic equations. If the real roots exist, find them:(i)

$$2x^2 - 3x + 5 = 0 \text{ (ii)}$$

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

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

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4. Find the values of k for each of the following quadratic equations, so that they have two equal roots.(i)

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



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5. Find the values of k for each of the following quadratic equations, so that they have two equal roots.(i)

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



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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 or rectangular park of perimeter 40 m and area $400m^2$? If so, find its length and breadth.

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NCERT EXEMPLAR (Exercise- 4.1)

1. Which of the following is a quadratic equation?

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

B. $-2x^2 = (5 - x)\left(2x - \frac{2}{5}\right)$

C. $(k + 1)x^2 + \frac{3}{2}x = 7$, where $k = -1$

D. $x^3 - x^2 = (x - 1)^3$

Answer: D



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2. Which of the following is not a quadratic equation?

A. $2(x - 1)^2 = 4x^2 - 2x + 1$

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

C. $(\sqrt{2}x + \sqrt{3})^2 + x^2 = 3x^2 - 5x$

D. $(x^2 + 2x)^2 = x^4 + 3 + 4x^3$

Answer: C



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3. Which of the following equations has 2 as a root?

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

B. $x^2 + 3x - 12 = 0$

C. $2x^2 - 7x + 6 = 0$

D. $3x^2 - 6x - 2 = 0$

Answer: C



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4. If $\frac{1}{2}$ is a root of the equation $x^2 + kx - \frac{5}{4} = 0$, then find the value of k .

A. 2

B. -2

C. $\frac{1}{4}$

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

Answer: A



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5. Which of the following equations has the sum of its roots as

3? (a) $2x^2 - 3x + 6 = 0$ (b) $x^2 + 3x - 3 = 0$ (c)

$$\sqrt{2}x^2 - \frac{-3}{\sqrt{2}}x + 1 = 0 \quad (\text{d}) \quad 3x^2 - 3x + 3 = 0$$

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

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

C. $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x + 1 = 0$

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

Answer: B



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6. Value(s) of k for which the quadratic equation

$2x^2 - kx + k = 0$ has equal roots is/are

A. 0 only

B. 4

C. 8 only

D. 0,8

Answer: D



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7. Which constant must be added and subtracted to solve the quadratic equation $9x^2 + \frac{3}{4}x - \sqrt{2} = 0$ by the method of completing the square?

A. $\frac{1}{8}$

B. $\frac{1}{64}$

C. $\frac{1}{4}$

D. $\frac{9}{64}$

Answer: B



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8. The quadratic equation $2x^2 - \sqrt{5}x + 1 = 0$ has

- (a) two distinct real roots (b) two equal real roots
(c) no real roots (d) more than 2 real roots

- A. two distinct real roots
B. two equal real roots
C. no real roots
D. more than 2 real roots

Answer: C



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9. Which of the following equations has two distinct real roots?

A. $2x^2 - 3\sqrt{2}x + \frac{9}{4} = 0$

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

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

D. $5x^2 - 3x + 1 = 0$

Answer: B



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10. Which of the following equations has no real roots?

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

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

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

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

Answer: A



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11. $(x^2 + 1)^2 - x^2 = 0$ has

A. four real roots

B. no real roots

C. two real roots

D. one real root

Answer: C



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NCERT EXEMPLAR (Exercise- 4.2)

1. State whether the following quadratic equations have two distinct real roots. Justify your answer:

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



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2. State whether the following quadratic equations have two distinct real roots. Justify your answer:

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



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3. State whether the following quadratic equations have two distinct real roots. Justify your answer:

$$2x^2 - 6x + \frac{9}{2} = 0$$



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4. State whether the following quadratic equations have two distinct real roots. Justify your answer:

$$3x^2 - 4x + 1 = 0$$



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5. State whether the following quadratic equations have two distinct real roots. Justify your answer:

$$(x + 4)^2 - 8x = 0$$

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6. State whether the following quadratic equations have two distinct real roots. Justify your answer:

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

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7. State whether the following quadratic equations have two distinct real roots. Justify your answer:

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

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8. State whether the following quadratic equations have two distinct real roots. Justify your answer:

$$x(1 - x) - 2 = 0$$



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9. State whether the following quadratic equations have two distinct real roots. Justify your answer:

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



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10. State whether the following quadratic equations have two distinct real roots. Justify your answer:

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

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11. Write whether the following statements are true or false.

Justify your answers.

Every quadratic equation has exactly one root.

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12. Write whether the following statements are true or false.

Justify your answers.

Every quadratic equation has at least one real root.

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13. Write whether the following statements are true or false.

Justify your answers.

Every quadratic equation has at least two roots.



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14. Write whether the following statements are true or false.

Justify your answers.

Every quadratic equation has at most two roots.



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15. Write whether the following statements are true or false.

Justify your answers.

(i) Every quadratic equation has exactly one root.

(ii) Every quadratic equation has atleast one real root.

(ii) Every quadratic equation has atleast two roots.

(iv) Every quadratic equations atleast two roots.

(v) If he coefficient of x^2 and the constnat term of a quadratic equation have opposite sigh, then the quadratic equation has real roots.

(vi) If the coefficient of x^2 and the constant term have the same sign and if the coefficient of x term is zero, then the quadratic equation has no real roots.



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16. If the coefficient of x^2 and the constant term have the same sign and if the coefficient of x term is zero, then the quadratic equation has no real roots. State true or false and justify your answer.



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17. A quadratic equation with integral coefficients has integral roots. Justify your answer.

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18. Does there exist a quadratic equation whose coefficients are rational but both of its roots are irrational? Justify your answer.

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19. Does there exist a quadratic equation whose coefficients are all distinct irrationals but both the roots are rationals? Why?

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20. Is 0.2 a root of the equation $x^2 - 0.4 = 0$? Justify your answer.



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21. If $b = 0, c < 0$, is it true that the roots of $x^2 + bx + c = 0$ are numerically equal and opposite in sign? Justify your answer.



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NCERT EXEMPLAR (Exercise- 4.3)

1. Find the roots of the quadratic equations by using the quadratic formula in each of the following

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



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2. Find the roots of the quadratic equations by using the quadratic formula in each of the following

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



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3. Find the roots of the quadratic equations by using the quadratic formula in each of the following

$$-3x^2 + 5x + 12 = 0$$



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4. Find the roots of the quadratic equations by using the quadratic formula in each of the following

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



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5. Find the roots of the quadratic equations by using the quadratic formula in each of the following:

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



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6. Find the roots of the quadratic equations by using the quadratic formula in each of the following:

$$x^2 - 3\sqrt{5}x + 10 = 0$$



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7. Find the roots of the quadratic equations by using the quadratic formula in each of the following

$$\frac{1}{2}x^2 - \sqrt{11}x + 1 = 0$$

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8. Find the roots of the following quadratic equations by the factorisation method.

$$2x^2 + \frac{5}{3}x - 2 = 0$$

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9. Find the roots of the following quadratic equations by the factorization method:

$$\frac{2}{5}x^2 - x - \frac{3}{5} = 0$$

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10. Find the roots of the following quadratic equations by the factorisation method.

$$3\sqrt{2}x^2 - 5x - \sqrt{2} = 0$$

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11. Find the roots of the following quadratic equations by the factorization method:

$$3x^2 + 5\sqrt{5}x - 10 = 0$$



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12. Find the roots of the following quadratic equations by the factorization method:

$$21x^2 - 2x + \frac{1}{21} = 0$$

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NCERT EXEMPLAR (Exercise- 4.4)

1. Find whether the following equations have real roots. If real roots exist, find them

$$8x^2 + 2x - 3 = 0$$

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2. Which of the following quadratic equations has real roots ?

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3. Find whether the following equations have real roots. If real roots exist, find them

$$5x^2 - 2x - 10 = 0$$

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4. Find whether the following equations have real roots. If real roots exist, find them

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

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5. Find whether the following equations have real roots. If real roots exist, find them

$$x^2 + 5\sqrt{5}x - 70 = 0$$



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6. Find a natural number whose square diminished by 84 is equal to thrice of 8 more than the given number.



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7. A natural number when increased by 12, equals 160 times its reciprocal. Find number.



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8. Solve the following questions.

(ii) A train travels 360 km with uniform speed. The speed of the train is increased by 5 km/hr , it takes 48 minutes less to cover the same distance. Find the initial speed of the train.

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9. If Zeba were younger by 5 years than what she really is, then the square of her age (in years) would have been 1 more than five times her actual age. What is her age now?

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10. At present Asha's age (in years) is 2 more than the square of her daughter Nisha's age. When Nisha grows to her mother's

present age, Asha's age would be one year less than 10 times the present age of Nisha. Find the present ages of both Asha and Nisha.

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11. IN the centre of a rectangular lawn of dimensions $50m \times 40m$, a rectangular pond has to be constructed, so that the area of the grass surrounding the pond would be $1184m^2$. Find the length and breadth of the pond.

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12. At t minutes past 2 pm, the time needed by the minutes hand of a clock to show 3pm was found to be 3 minutes less than $(t^2)/4$ minutes. Find t .



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BOARD CORNER (Very Short Answer Type Questions)

1. For what values of k , the roots of the equation $x^2 + 4x + k = 0$ are real?



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2. Find the value of k for which the roots of the equation $3x^2 - 10x + k = 0$ are reciprocal of each other.



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3. Find the nature of roots of the quadratic equation

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



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4. Find the nature of the roots of the quadratic equation

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



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5. If $x=3$ is one root of the quadratic equation

$$x^2 - 2kx - 6 = 0, \text{ then find the value of } k$$



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BOARD CORNER (Short Answer Type Questions)

1. Write all the value of p for which the quadratic equation $x^2 + px + 16 = 0$ has equal roots. Find the roots of the equation so obtained.



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2. Solve $x^2 + 5x - (a^2 + a - 6) = 0$.



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3. A plane left 30 minutes late than its scheduled time and in order to reach the destination 1500 km away in time, it had to increase the speed by 250 km/h from the usual speed. Find its usual speed.



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4. Find the roots of the quadratic equation

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



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5. (i) Find the values of k for which the quadratic equation

$$(3k + 1)x^2 + 2(k + 1)x + 1 = 0 \text{ has real and equal roots.}$$

(ii) Find the value of k for which the equation

$$x^2 + k(2x + k - 1) + 2 = 0 \text{ has real and equal roots.}$$



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6. Find the value of p , for which one root of the quadratic equation $px^2 - 14x + 8 = 0$ is 6 times the other.



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



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8. 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 $a^3 + b^3 + c^3 = 3ab$.



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



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BOARD CORNER (Long Answer Type Questions)

1. 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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2. In a class test, the sum of Kamal's marks in mathematics and English is 40. Had he got 3 marks more in mathematics and 4 marks less in English, the product of the marks would have been 360. Find his marks in two subjects separately.



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3. The total cost of a certain length of a piece of wire is Rs. 200. If the piece was 5 metres longer and each metre of wire costs Rs. 2 less, the cost of the piece would have remained unchanged. How long is the piece and what is its original rate per metre?



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4. A motor boat whose speed is 18 km/h in 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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5. A train travels at a certain average speed for a distance of 63km and then travels a distance of 72km at an average speed of 6 km/hr more than its original speed. If it takes 3 hours to complete the total journey, what is its original average speed?



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6. 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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7. Solve for x : $\frac{x - 1}{2x + 1} + \frac{2x + 1}{x - 1} = 2$, where $x \neq -\frac{1}{2}, 1$



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8. A can do a piece of work in 4 days. B and C together can do it in 3 days, while A and C together can do it in 2 days. How many days will B take to do the work alone?



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Stand alone MCQs

1. Choose the correct alternative.

(i) Which of the following is a quadratic equation?

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

B. $-2x^2 = (5 - x)\left(2x - \frac{2}{5}\right)$

C. $(k + 1)x^2 + \frac{3}{2}x = 7$, where $k = -1$

D. $x^3 - x^2 = (x - 1)^3$

Answer: D



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2. Which of the following is not a quadratic equation

A. $2(x - 1)^2 = 4x^2 - 2x + 1$

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

C. $(\sqrt{2}x + \sqrt{3})^2 + x^2 = 3x^2 - 5x$

D. $(x^2 + 2x^2) = x^4 + 3 + 4x^3$

Answer: C



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3. If $\frac{1}{2}$ is a root of the equation $x^2 + kx - \frac{5}{4} = 0$, then find the value of k.

A. 2

B. -2

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

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

Answer: A



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4. Which of the following equations has 2 as a root?

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

B. $x^2 + 3x - 12 = 0$

C. $2x^2 - 7x + 6 = 0$

D. $3x^2 - 6x - 2 = 0$

Answer: C



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5. Which of the following equations has the sum of its roots as

3? (a) $2x^2 - 3x + 6 = 0$ (b) $x^2 + 3x - 3 = 0$ (c)

$$\sqrt{2}x^2 - \frac{-3}{\sqrt{2}}x + 1 = 0 \quad \text{(d) } 3x^2 - 3x + 3 = 0$$

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

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

C. $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x + 1 = 0$

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

Answer: B



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6. If one root of the equation $2x^2 + ax + 6 = 0$ is 2 then $a = ?$

A. 7

B. -7

C. $-\frac{7}{2}$

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

Answer: B



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7. If the sum of the roots of the equation $kx^2 + 2x + 3k = 0$ is equal to their product then the value of k is

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

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

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

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

Answer: D



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8. The ratio of the sum and product of the roots of the equation $7x^2 - 12x + 18 = 0$ is

- A. 2 : 3
- B. 7 : 18
- C. 7 : 12
- D. 3 : 2

Answer: A

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9. if the roots of the equation $4x^2 + 4\sqrt{3}x + k = 0$ are equal then what is the value of k ?

- A. 2 or 0
- B. 2 or -2
- C. -2 or 0
- D. only 0

Answer: B



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10. The roots of the equation $2x^2 - 6x + 7 = 0$ are

- A. real, unequal and rational
- B. real and unequal
- C. imaginary
- D. real, unequal and irrational

Answer: C



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11. Which of the following equations has two distinct real roots?

A. $2x^2 - 3\sqrt{2x} + \frac{9}{4} = 0$

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

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

D. $5x^2 - 3x + 1 = 0$

Answer: B



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12. Value(s) of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is/are

A. 0 only

B. 4

C. 8 only

D. 0,8

Answer: D



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13. Which constant must be added and subtracted to solve the quadratic equation $9x^2 + \frac{3}{4}x - \sqrt{2} = 0$ by the method of completing the square?

A. $\frac{1}{8}$

B. $\frac{1}{64}$

C. $\frac{1}{4}$

D. $\frac{9}{64}$

Answer: B



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14. The quadratic equation $2x^2 - \sqrt{5}x + 1 = 0$ has

(a) two distinct real roots (b) two equal real roots

(c) no real roots (d) more than 2 real roots

A. two distinct real roots

B. two equal real roots

C. no real roots

D. more than 2 real roots

Answer: C



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15. Which of the following equations has no real roots?

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

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

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

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

Answer: A



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16. $(x^2 + 1)^2 - x^2 = 0$ has

(i) four real roots (ii) two real roots

(iii) no real roots (iv) one real root

A. four real roots

B. two real roots

C. no real roots

D. one real roots

Answer: C



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Assertion and Reason Based MCQs

1. Solve each of the following quadratic equations:

$$2x^2 + ax - a^2 = 0$$

A. Both A and R are true and R is the correct explanation for

A.

B. Both A and R are true and R is not correct explanation for

A.

C. A is true but R is false

D. A is false but R is true

Answer: D



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2. Assertion (A) : The degree of quadratic equation is always 2 and $x^2 - 1 = 0$ is pure quadratic equation.

Reason (R) : An equation of the form $ax^2 + c = 0$ is known as pure quadratic equation.

A. Both A and R are true and R is the correct explanation for

A.

B. Both A and R are true and R is not correct explanation for

A.

C. A is true but R is false

D. A is false but R is true

Answer: A



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3. 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.

A. Both A and R are true and R is the correct explanation for

A.

B. Both A and R are true and R is not correct explanation for

A.

C. A is true but R is false

D. A is false but R is true

Answer: D



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4. Assertion (A) : The product of two successive positive integral multiples of 5 is 300, then the two numbers are 15 and 20.

Reason (R) : The product of two consecutive integers is a multiple of 2

A. Both A and R are true and R is the correct explanation for

A.

B. Both A and R are true and R is not correct explanation for

A.

C. A is true but R is false

D. A is false but R is true

Answer: B



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5. Assertion (A) : The roots of the quadratic equation $x^2 + 2x + 2 = 0$ are imaginary.

Reason (R) : If discriminant $D = b^2 - 4ac < 0$ then the roots of the quadratic equation $ax^2 + bx + c = 0$ are imaginary.

A. Both A and R are true and R is the correct explanation for

A.

B. Both A and R are true and R is not correct explanation for

A.

C. A is true but R is false

D. A is false but R is true

Answer: A



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



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7. Solve for x , $9^{x+2} - 6 \cdot 3^{x+1} + 1 = 0$

A. Both A and R are true and R is the correct explanation for

A.

B. Both A and R are true and R is not correct explanation for

A.

C. A is true but R is false

D. A is false but R is true

Answer: C



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8. Assertion (A) : The equation $8x^2 + 3kx + 2 = 0$ has equal roots than the value of k is $\pm \frac{8}{3}$.

Reason (R) : The equation $ax^2 + bx + c = 0$ has equal roots if $D = b^2 - 4ac = 0$.

A. Both A and R are true and R is the correct explanation for

A.

B. Both A and R are true and R is not correct explanation for

A.

C. A is true but R is false

D. A is false but R is true

Answer: A



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Case-Based MCQs

1. Nidhi and Ria are very close friends. Nidhi's parents own a Maruti Alto and Ria's parents own a Toyota Liva. Both the families decided to go for picnic to Somnath temple in Gujarat by their own cars. Nidhi car travels x km/h when Ria's car travels 5 km/h more than Nidhi's car. Nidhi's car took 4 hours more than Ria's car in covering 400 km.



What will be the distance covered by Ria's car in two hours ?

A. $2(x + 5)km$

B. $(x - 5)km$

C. $2(x + 10)km$

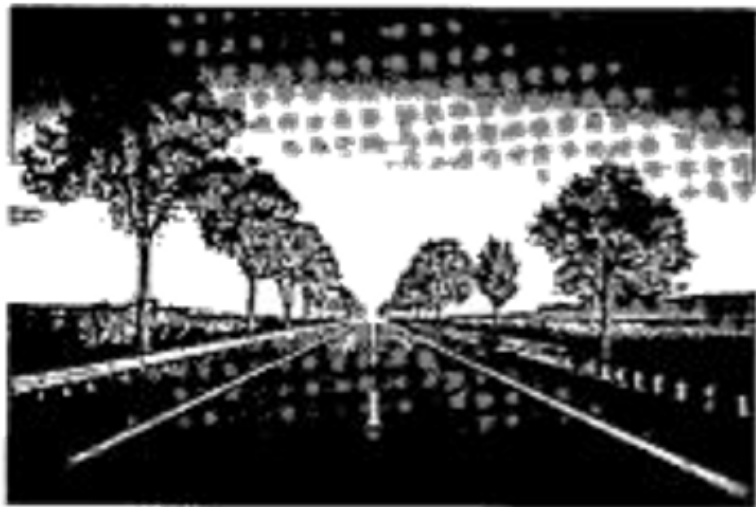
D. $(2x + 5)$

Answer: A



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2. Nidhi and Ria are very close friends. Nidhi's parents own a Maruti Alto and Ria's parents own a Toyota Liva. Both the families decided to go for picnic to Somnath temple in Gujarat by their own cars. Nidhi car travels x km/h when Ria's car travels 5 km/h more than Nidhi's car. Nidhi's car took 4 hours more than Ria's car in covering 400 km.



Which of the following quadratic equations describe the speed of Nidhi's car ?

A. $x^2 - 5x - 500 = 0$

B. $x^2 + 5x - 500 = 0$

C. $x^2 + 4x - 400 = 0$

D. $x^2 - 4x - 400 = 0$

Answer: C



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3. Nidhi and Ria are very close friends. Nidhi's parents own a Maruti Alto and Ria's parents own a Toyota Liva. Both the families decided to go for picnic to Somnath temple in Gujarat by their own cars. Nidhi car travels x km/h when Ria's car travels 5 km/h more than Nidhi's car Nidhi's car took 4 hours more than Ria' car in covering 400 km.



What is the speed of Nidhi's car ?

A. 20 km/h

B. 15 km/h

C. 25 km/h

D. 10km/h

Answer: A



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4. Nidhi and Ria are very close friends. Nidhi's parents own a Maruti Alto and Ria's parents own a Toyota Liva. Both the families decided to go for picnic to Somnath temple in Gujarat by their own cars. Nidhi car travels x km/h when Ria's car travels 5 km/h more than Nidhi's car Nidhi's car took 4 hours more than Ria' car in covering 400 km.



How much time took Ria to travel 400 km ?

- A. 20 hour
- B. 40 hour
- C. 25 hour
- D. 16 hour

Answer: D



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5. Nidhi and Ria are very close friends. Nidhi's parents own a Maruti Alto and Ria's parents own a Toyota Liva. Both the families decided to go for picnic to Somnath temple in Gujarat by their own cars. Nidhi car travels x km/h when Ria's car travels 5 km/h more than Nidhi's car Nidhi's car took 4 hours more than Ria' car in covering 400 km.



Name the shape of quadratic equation in graph

A. Spiral

B. ellipse

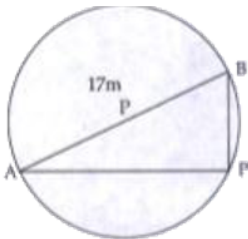
C. linear

D. Parabola

Answer: D



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6.

Aniket is studying in X standard. He is created a pole at on the boundary of a circular park of diameter 17 m in such a way that the difference of its distances from two diametrically opposite fixed gets A and B on the boundary is 7m.

Find a quadratic equations in variable x for above situation.

A. $x^2 + 7x - 120 = 0$

B. $x^2 + 5x - 120 = 0$

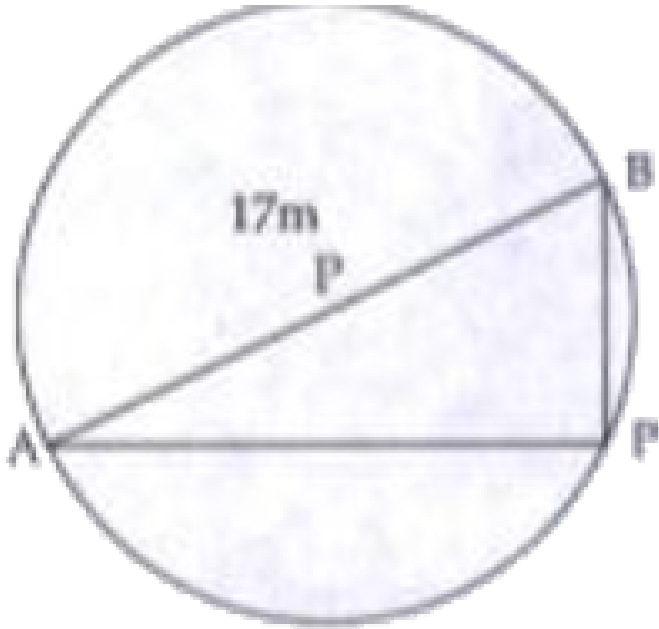
C. $x^2 + 7x - 120 = 0$

D. None of these

Answer: A



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7.

Aniket is studying in X standard. He is created a pole at on the boundary of a circular park of diameter 17 m in such a way that the difference of its distances from two diametrically opposite fixed gets A and B on the boundary is 7m.

Find the distance between pole and gate B.

A. 9m

B. 8m

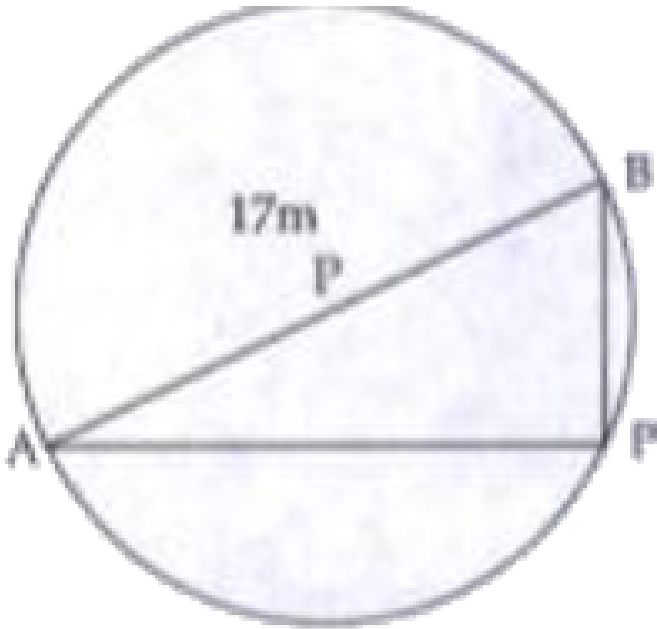
C. 10m

D. 12m

Answer: B



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8.

Aniket is studying in X standard. He has created a pole at P on the boundary of a circular park of diameter 17 m in such a way that the difference of its distances from two diametrically opposite fixed gates A and B on the boundary is 7 m .

Find the distance between pole and gate A .

A. 20m

B. 118m

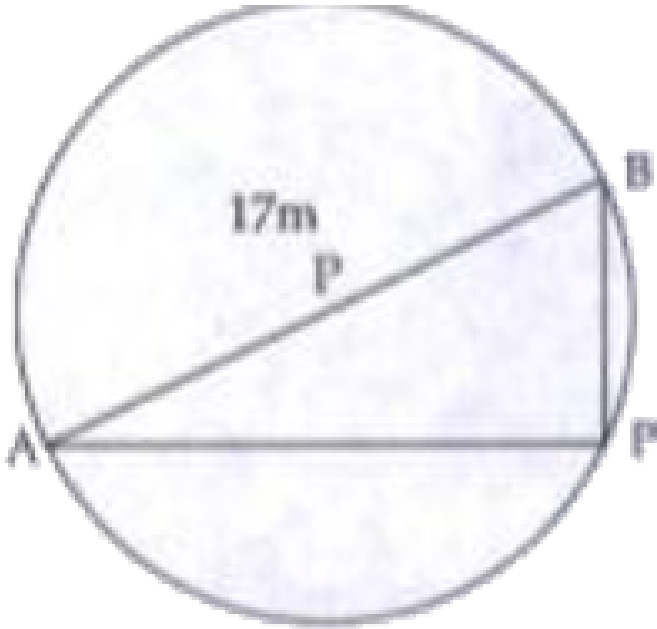
C. 15m

D. 17m

Answer: C



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9.

Aniket is studying in X standard. He has created a pole at point P on the boundary of a circular park of diameter 17 m in such a way that the difference of its distances from two diametrically opposite fixed points A and B on the boundary is 7 m .

What is the length of $(AP + BP)$?

A. 20m

B. 22m

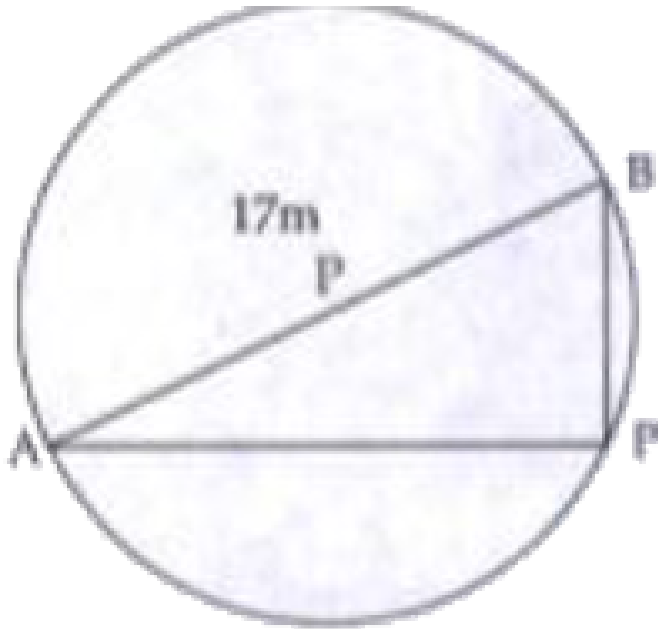
C. 23m

D. 25m

Answer: C



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10.

Aniket is studying in X standard. He created a pole at on the boundary of a circular park of diameter 17 m in such a way that the difference of its distances from two diametrically opposite fixed gets A and B on the boundary is 7m.

Find the area of triangle ABP .

A. $50m^2$

B. $40m^2$

C. $60m^2$

D. $70m^2$

Answer: C



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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 to

A. $3 + 2x$

B. $2 + 3x$

C. $2(x + 3)$

D. $2x - 3$

Answer: B



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12. 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 to

A. $3x^2 + 2x + 85$

B. $3x^2 - 2x + 85$

C. $3x^2 + 2x - 85$

D. $-3x^2 + 2x + 85$

Answer: C



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13. 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 to

- A. Real and Equal
- B. Unreal
- C. Real and Unequal
- D. None

Answer: C



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14. 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 to

A. 5

B. 6

C. 17

D. 8

Answer: A



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15. 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 to

A. 161

B. 150

C. 200

D. 155

Answer: A



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Multiple Choice Question

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

A. 3

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

C. 6

D. -3

Answer: A



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2. The roots of the equation $x^2 - 3x - 9 = 0$ are :

A. real and unequal

B. real and equal

C. roots are not equal

D. imaginary roots

Answer: A



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3. The value of x in $x - \frac{18}{x} = 6$ is :

A. real and unequal

B. real and equal

C. roots are imaginary

D. roots are not equal

Answer: A



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4. The roots of the quadratic equation $x^2 - 0.04 = 0$.

A. ± 0.2

B. ± 0.02

C. 0.4

D. 2

Answer: A



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5. Value(s) of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is/are

A. 0 only

B. 4

C. 8 only

D. 0, 8

Answer: D



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6. The roots of the equation $x^2 - x - 6$ are:

A. real and equal

B. real and unequal

C. unreal

D. none of these

Answer: B



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7. The quadratic equation whose roots are 3 and -3 is .

A. $x^2 + 9 = 0$

B. $x^2 - 9 = 0$

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

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

Answer: B



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8. If α and β are the zeros of $x^2 + 5x + 8$ then the value of $(\alpha + \beta)$ is

A. 5

B. 8

C. -5

D. -8

Answer: C



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9. The discriminant of the quadratic equation

$$3x^2 - 4x - 2 = 0 \text{ is}$$

A. 40

B. 20

C. 24

D. 48

Answer: A



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10. If $ax^2 + bx + c = 0$ has equal roots, find the value of c .

A. $\frac{-b}{2a}$

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

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

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

Answer: D



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11. If one root of the equation $2x^2 + 3x + c = 0$ is 0.5, then what is the value of c ?

A. -1

B. -2

C. -3

D. -4

Answer: B



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12. The equation whose roots are twice the roots of the equation $x^2 - 2x + 4 = 0$ is

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

B. $x^2 - 2x + 16 = 0$

C. $x^2 - 4x + 8 = 0$

D. $x^2 - 4x + 16 = 0$

Answer: D



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13. The difference in the roots of the equation

$2x^2 - 11x + 5 = 0$ is :

A. 4.5

B. 4

C. 3.5

D. 3

Answer: A



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14. If α and β are the roots of the equation $x^2 + px + q = 0$, then what is $\alpha^2 + \beta^2$ equal to ?

A. $p^2 - 2q$

B. $q^2 - 2p$

C. $p^2 + 2q$

D. $q^2 - p$

Answer: A



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15. In the quadratic equation $x^2 + ax + b = 0$, a and b can take any value from the set {1, 2, 3, 4}. How many pairs of values of a and b are possible in order that the quadratic equation has real roots ?

A. 6

B. 7

C. 8

D. 16

Answer: B



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16. For which value of k does the pair of equation $x^2 - y^2 = 0$ and $(x-k)^2 + y^2 = 1$ yield a unique positive solution of x ?

A. 2

B. 0

C. $\sqrt{2}$

D. $-\sqrt{2}$

Answer: C



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17. If the root of the equation $Ax^2 - Bx + C = 0$ are -1 and 1, then which one of the following is correct?

A. A and C are both zero

B. A and B are both positive

C. A and C are both negative

D. A and C are of opposite sign

Answer: D



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18. If the roots of the equation $(a^2 - bc)x^2 + 2(b^2 - ac)x + (c^2 - ab) = 0$ are equal, where $b = 0$, then which one of the following is correct ?

A. $a + b + c = abc$

B. $a^2 + b^2 + c^2 = 0$

C. $a^3 + b^3 + c^3 = 3a$

D. $a^3 + b^3 + c^3 = 3abc$

Answer: C



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19. If one root of

$$(a^2 - 5a + 3)x^2 + (3a - 1)x + 2 = 0$$

is twice the other, then what is the value of 'a' ?

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

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

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

D. $-\frac{1}{3}$

Answer: A

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20. If 3 is a root of the equation $kx^2 - kx - 3 = 0$, then the value of k is

A. 3

B. $1/2$

C. 4

D. 2

Answer: B



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21. If the zeroes of the quadratic polynomial $x^2 + (a + 1)x + b$ are 2 and -3, then

A. 0, 7

B. 0, - 7

C. 2, 3

D. none of these

Answer: B



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22. Solve $\sqrt{2x + 9} + x = 13$.

A. - 8, - 20

B. - 8, 20

C. 8, 20

D. 8, - 20

Answer: C



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23. The nature of roots of the equation $2x^2 + \sqrt{5x} - 1 = 0$ is

.....

- A. real and equal
- B. imaginary and equal
- C. imaginary and unequal
- D. real and unequal

Answer: D



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

A. $\frac{2.5}{16}$

B. $\frac{25}{16}$

C. $\frac{25}{4}$

D. $\frac{5}{16}$

Answer: B



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25. Which of the following is not a quadratic equation?

A. $2(x + 1)^2 = 4x^2 - 2x + 1$

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

C. $(\sqrt{2}x + \sqrt{3}x)^2 + x^2 = 3x^2 - 5x$

D. $(x^2 + 2x)^2 = x^4 + 3 + 4x^2$

Answer: D



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26. Which of the following equations has 2 as a root?

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

B. $x^2 + 3x - 12 = 0$

C. $2x^2 - 7x + 6 = 0$

D. $3x^2 - 6x - 2 = 0$

Answer: C



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27. If $\frac{1}{2}$ is a root of the equation $x^2 + kr - \frac{5}{4} = 0$, then the value of k is :

A. 2

B. -2

C. $\frac{1}{4}$

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

Answer: A



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28. Which one of the following is a quadratic equation?

A. $(a + 1)x^2 - \frac{3}{5}x = 11$, where $a \neq -1$

B. $(3 - x)^2 - 5 = x^2 + 2x + 1$

C. $8x^3 - x^2 = (2x - 1)^3$

D. $-3x^2 = (2 - x)\left(3x - \frac{1}{2}\right)$

Answer: A



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29. Which of the following is a solution of quadratic equation

$$x^2 - b^2 = a(2x - a) ?$$

A. $a + b$

B. $2b - a$

C. ab

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

Answer: A



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30. The roots of the quadratic equation

$x^2 - 3x - m(m + 3) = 0$, where m is a constant are :

A. $m, m + 3$

B. $-m, m + 3$

C. $m, -(m + 3)$

D. $-m, -(m + 3)$

Answer: B



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31. The quadratic equation $2y^2 - \sqrt{3}y + 1 = 0$ has

- A. more than two real roots
- B. two equal real roots
- C. no real roots
- D. two distinct real roots

Answer: C



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32. Which one of the following equations has no real roots?

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

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

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

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

Answer: A



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

A. $k \leq 4$

B. $k < 4$

C. $k > 4$

D. $k \geq 4$

Answer: B



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34. The quadratic equation $49x^2 + 21x + \frac{9}{4} = 0$ has

- A. real and equal roots
- B. four real roots
- C. real and unequal roots
- D. no real roots

Answer: A



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35. The general form of a quadratic equation is :

A. $ax^2 + bx + c$

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

C. $a^2x + b$

D. $ax^2 + bx + c = 0, a \neq 0$

Answer: D



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36. The number of possible solutions of a quadratic equation are :

A. exactly two

B. at most two

C. at least two

D. None of these

Answer: B



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37. The roots of $3x^2 - 7x + 4 = 0$ are :

- A. rationals
- B. irrationals
- C. Positive integers
- D. negative integers

Answer: A



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38. The roots of equation $x + \frac{16}{x} = 10$ are :

A. 4, 6

B. 4, 4

C. 4, 5

D. 2, 8

Answer: D



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39. If α, β are the roots of $x^2 + px + q = 0$, then the value of

$\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$ is:

A. $\frac{p^2 - 2q}{q}$

B. $\frac{2q - p^2}{q}$

C. $\frac{p^2 + 2q}{q}$

D. none of these

Answer: A



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40. If the roots of $ax^2 + bx + c = 0$ (be equal, then the value of c is:

A. $-\frac{b}{2a}$

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

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

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

Answer: D



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41. If the sum of the roots of an equation is 6 and one root is $3 - \sqrt{5}$, then the equation is :

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

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

C. $x^2 - 6x + 5 = 0$

D. none of these

Answer: A



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42. If α, β be the roots of $ax^2 + bx + c = 0$, then the value of $\alpha^2 + \beta$ is :

A. $\frac{b^2 - 2ac}{2a}$

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

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

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

Answer: C



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43. The quadratic equation whose roots are $a, \frac{1}{a}$ is :

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

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

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

D. none of these

Answer: A



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44. 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. The speed of the train is :

A. 30 km/h

B. 35 km/h

C. 12 km/h

D. 40 km/h

Answer: D



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45. The roots of the equation $\sqrt{2x + 9} + x = 13$ are :

A. 8, - 20

B. 20, - 8

C. - 20, - 8

D. 20, 8

Answer: D



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46. If $x = 1$ is a common root of the equation

$ax^2 + ax + 3 = 0$ and $x^2 + x + b = 0$ then $ab =$

A. 6

B. 3

C. -3

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

Answer: B



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47. Find the values of k for which the quadratic equation $kx(x - 3) + 9 = 0$ has real equal roots

A. $k = 0$ or $k = 4$

B. $k = 1$ or $k = 4$

C. $k = -3$ or $k = 3$

D. $k = -4$ or $k = 4$

Answer: A



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48. If the quadratic equation $px^2 - 2\sqrt{5}px + 15 = 0$ has two equal roots then value of p:

- A. 0, 3
- B. 0, - 3
- C. 3, 4
- D. 5, 4

Answer: A



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49. The sum of a number and its reciprocal is $\frac{10}{3}$ Find the number :

A. 3

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

C. both (a) and (c)

D. none of these

Answer: C



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50. If one of the roots of a quadratic equation having rational coefficients is $\sqrt{7} - 4$, then the quadratic equation is

A. $x^2 - 2\sqrt{7}x - 9 = 0$

B. $x^2 - 8x + 9 = 0$

C. $x^2 + 8x + 9 = 0$

D. $x^2 - 2\sqrt{7}x + 9 = 0$

Answer: A



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51. For what value of k is one root of the quadratic equation $9x^2 - 18x + k = 0$ double the other?

A. 36

B. 9

C. 12

D. 8

Answer: D



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52. The condition for the sum and the product of the roots of the quadratic equation $ax^2 - bx + c = 0$ to be equal, is

A. $b + c = 0$

B. $b - c = 0$

C. $a + c = 0$

D. $a + b + c = 0$

Answer: B



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53. Find the value of $\sqrt{30 + \sqrt{30 + \sqrt{30 + \dots \infty}}}$

A. 6

B. -5

C. Either (1) and (2)

D. Neither (1) and (2)

Answer: A



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54. The roots of $x^2 - (a + 1)x + b^2 = 0$ are equal. Then choose the correct value of a, b from the following option :

A. 5,2

B. 3,4

C. 5, -3

D. 5, 4

Answer: C



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55. The solution of the equation $x^2 + x + 1 = 1$ is

A. $x = 0$

B. $x = -1$

C. Both (a) and (b)

D. Cannot be determined

Answer: C



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56. If one of the roots of an equation, $x^2 - 2x + c = 0$ is thrice the other, then $c = ?$

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

B. $\frac{4}{3}$

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

D. $\frac{3}{4}$

Answer: D



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57. The roots of the equation $x^2 + 5x + 1 = 0$ are

A. $\frac{5 + \sqrt{21}}{2}, \frac{5 - \sqrt{21}}{2}$

B. $\frac{-5 - \sqrt{21}}{2}, \frac{5 + \sqrt{21}}{2}$

C. $\frac{-5 + \sqrt{21}}{2}, \frac{-5 - \sqrt{21}}{2}$

D. $\frac{-5 + \sqrt{29}}{2}, \frac{-5 - \sqrt{29}}{2}$

Answer: C



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58. The roots of $x^2 - 2x - 1 = 0$ are

A. $\sqrt{2} + 1, \sqrt{2} - 1$

B. $1, \sqrt{2}$

C. $1 + \sqrt{2}, 1 - \sqrt{2}$

D. $2, 1$

Answer: C



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59. The age of a father is 25 years more than his son's age. The product of their ages is 84 in years. What will be son's age in year, after 10 years?

A. 3

B. 28

C. 13

D. 18

Answer: C



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Very Short Answer Type Question

1. The perimeter of an isosceles triangle is 65 cm and the unequal side is thrice as large as each of the equal sides. Find the lengths of the sides.



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



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3. Is the roots of the equation $x^2 - 3x - 9 = 0$ are real and distinct?



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4. For what values of k , the roots of the equation

$$x^2 + 4x + k = 0 \text{ are real?}$$



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5. The solution of a quadratic equation is as follows:

$$x = \frac{8 \pm \sqrt{(-8)^2 - 4(3)(2)}}{2(3)}$$

Then find the quadratic

equation.



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



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



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8. Solve for : $x\sqrt{6x+7} - (2x-7) = 0$



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9. Solve : $12abx^2 - (9a^2 - 8b^2)x - 6ab = 0$



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10. Solve : $p^2x^2 + (p^2 - q)x - q^2 = 0$



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11. Find the value of k for which the equation $x^2 + k(2x + k - 1) + 2 = 0$ has real and equal roots.



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12. A teacher on attempting to arrange the students for mass drill in the form of a solid square found that 24 students were left. When he increased the square by one row and one column, he was short of 25 students. Find the number of students.



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13. Solve : $4x^2 - 4a^2x + (a^4 - b^4) = 0$



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14. Solve : $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$



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15. Find the value of p , for which one root of the quadratic equation $px^2 - 14x + 8 = 0$ is 6 times the other.



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16. If -5 is a root of the 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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17. Find the value of k for which the roots of the equation $3x^2 - 10x + k = 0$ are reciprocal of each other.



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18. Find the value of k for which the equation $x^2 - 4kx + k = 0$ has real and equal roots.



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19. If the quadratic equation $px^2 - 2\sqrt{5}px + 15 = 0$, has two equal roots then find the value of p .



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



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21. A peacock is sitting on the top of a pillar which is 9 m high. From a point, 27 m away from the bottom of a 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 hole is the snake caught ?



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22. Solve the following quadratic equation for x :

$$9x^2 - 6b^2x - (a^4 - b^4) = 0$$

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23. Find the value of p for which the quadratic equation $(p + 1)x^2 - 6(p + 1)x + 3(p + 9) = 0$, $p \neq 1$ has equal roots.

Hence, find the roots of the equation.

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

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25. The numerator of a fraction is 3 less than its denominator. If 2 is added to both the numerator and the denominator, then

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



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26. Find the value of p for which the quadratic equation $(2p + 1)x^2 - (7p + 2)x + (7p - 3) = 0$ has equal roots. Also find these roots.



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



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28. Sum of the areas of two squares is 400cm^2 . If the difference of their perimeters is 16 cm, find the sides of the two squares.



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



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30. In there any real value of 'a' for which the equation $x^2 + 2x + (a^2 + 1) = 0$ has real roots?



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31. Write the condition to be satisfied for which equation $ax^2 + 2bx + c = 0$ and $bx^2 - 2\sqrt{acx} + b = 0$ have equal roots.



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



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33. In a rectangular park of dimensions 50 m x 40 m, a rectangular pond is constructed so that the area of grass strip of uniform width surrounding the pond would be $1184m^2$. Find the length and breadth of the pond.



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Short Answer Type Question

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



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



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3. Solve: $\frac{14}{x+3} - 1 = \frac{5}{x+1}$, where $x \neq -3, -1$



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4. Solve: $x^2 - 4ax - b^2 + 4a^2 = 0$



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5. The sum of two natural numbers is 8 and their product is 15.

Find the numbers.



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6. Solve : $4x^2 - 4ax + (a^2 - b^2) = 0$



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



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8. Solve : $\sqrt{7}y^2 - 6y - 13\sqrt{7} = 0$



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9. Divide 12 into two parts such that the sum of their squares is 74.



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10. The sum of two numbers is 15 and their reciprocals is $\frac{3}{10}$

Find the numbers.



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11. The sum of the squares of two consecutive natural numbers is 421. Find the numbers.



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12. The sum of the square of two consecutive odd numbers is 394 . Find the numbers.



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13. In a class test, the sum of Kamal's marks in Mathematics and English is 40. Had he secured 3 more marks in Mathematics and 4 less in English then, the product of the marks in both the tests would have been 360. Find the marks obtained by him in the two subjects separately.

 [View Text Solution](#)

14. A dealer sells a toy for Rs 24 and gains as much percent as the cost price of the toy. Find the cost price of the toy.

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15. The difference of the squares of two natural numbers is 45. The square of the smaller number is 4 times the larger number. Find the numbers.

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16. Three-eighth of the students of a class opted for visiting an old age home. Sixteen students opted for having a nature walk.

Square root of total number of students in the class opted for tree plantation in the school. The number of students who visited the old age home is same as the number of students who went for a nature walk and did tree plantation. Find the total number of students.



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17. A charity trust decides to build the player hall having a carpet area of 300 sq m with its length 1m more than twice its breadth. Find the length and breadth of the hall.



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18. Students of class X collected Rs18000. They wanted to divide it equally among a certain number of students residing in

slums area. When they started distributing the amount, 20 more students from nearby slums also joined. Now each student got Rs 240 less. Find the number of students living in the slum.



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19. 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 its usual speed.



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20. A train travels a distance of 360 km at uniform speed. If its speed is increased by 5 km/hr, the journey will take 1 hour less. Find the original speed of the train.



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21. The distance between Mumbai and Pune is 192 km. Travelling by the Deccan Queen, it takes 48 minutes less than another train. Calculate the speed of the Deccan Queen if the speeds of the two trains differ by 20 km/hr.



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22. The difference of the squares of two numbers is 88. If the larger number is 5 more than twice the smaller number then find the two numbers.



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23. Three consecutive natural numbers are such that the square of the middle number exceeds the difference of the squares of the other two by 60. Find the numbers.



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24. The sum of two numbers is 16 and sum of their reciprocals is $\frac{1}{3}$. Find the numbers.



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25. 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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26. Sumit is 3 times as old as his son. Five years later, he shall be two and a half times as old as his son. How old is Sumit at present?



[View Text Solution](#)

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



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Long Answer Type Question

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

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2. Solve for x : $3\left(\frac{7x+1}{5x-3}\right) - 4\left(\frac{5x-3}{7x+1}\right) = 11$, where $x \neq \frac{3}{5}, -\frac{1}{7}$

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3. Solve for x : $2\left(\frac{2x-1}{x+3}\right) - 3\left(\frac{x+3}{2x-1}\right) = 5$ where $x \neq \frac{1}{2}, -3$

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

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5. A shopkeeper buys some books for Rs 80. If he had bought 4 more books for the same amount then the price of each book would have been reduced by Rs 1. Find the number of books he bought.



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6. A takes 6 days less than B to do a work. If both A and B working together can do it in 4 days, how many days will B take to finish it?



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7. Write all the values of p for which the quadratic equation $x^2 + px + 16 = 0$ has equal roots. Find the roots of the

equation so obtained



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8. Solve for x :

$$\frac{1}{x+1} + \frac{3}{5x+1} = \frac{5}{x+4}, x \neq -1, -\frac{1}{5}, -4$$



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9. Solve $\frac{x-1}{x-2} + \frac{x-3}{x-4} = \frac{10}{3}$ where $x \neq 2, 4$



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10. Solve for x : $\left(\frac{4x-3}{2x+1}\right) - 10\left(\frac{2x+1}{4x-3}\right) = 3$, where $x \neq -\frac{1}{2}, \frac{3}{4}$



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11. Solve: $9x^2 - 9(a + b)x + (2a^2 + 5ab + 2b^2) = 0$

 [View Text Solution](#)

12. Solve for x : $x^2 + 5x - (a^2 + a - 6) = 0$.

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13. In a class test, the sum of Arun's marks in Hindi and English is 30. Had he got 2 marks more in Hindi and 3 marks less in English, the product of the marks would have been 210. Find his marks in the two subjects.

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14. 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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15. 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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16. 7 years ago, Varun's age was five times the square of Swati's age. 3 years hence, Swati's age will be two-fifths of Varun's age. Find their present ages.



[View Text Solution](#)

17. A train travels 288 km at a uniform speed. If the speed has been 4 km/hr more, it would have taken 1 hour less for the same journey. Find the speed of the train.



[View Text Solution](#)

18. An aeroplane left 30 minutes later than its scheduled time and in order to reach its destination 1500 km away on time, it had to increase its speed by 250 km/hr. Determine its usual speed.



[View Text Solution](#)

19. The sum of the areas of two squares is $260m^2$. If the difference of their perimeters is 24 m, then find the sides of the two squares.



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



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21. The hypotenuse of a right-angled triangle is 6 cm more than twice the shortest side. If the third side is 2 cm less than the hypotenuse, find the sides of the triangle.



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22. A person on tour has Rs 4,200 for his expenses. If he extends his tour by 3 days, he has to cut down his daily expenses by Rs 70. Find the original duration of the tour.



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23. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the rectangular park and of altitude 12 m. Find the length and breadth of the rectangular park.



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24. 300 apples were distributed equally among a certain number of students. Had there been 10 more students, each would have received one apple less. Find the number of students.



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25. The total cost of a certain length of a piece of cloth is Rs 200. If the piece was 5 m longer and each metre of cloth costs Rs 2 less, the cost of the piece would have remained unchanged. How long is the piece and what is its original rate per metre?



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26. Two taps running together can fill a tank in $3\frac{1}{13}$ hours. If one tap takes 3 hours more than the other to fill the tank, then how much time will each tap take to fill the tank?



[View Text Solution](#)

27. The sum of the areas of 2 squares is $640m^2$. If the difference of their perimeters is 64 m, then find the sides of the two squares.



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28. A passenger while boarding a plane hurt herself and the captain called for immediate medical attention. Thus the plane left 30 minutes behind schedule. In order to reach its

destination 1500 km away on time, the speed was increased by 100 km/hr from its usual speed. Find the usual speed.



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29. A bus travels at a certain average speed for a distance of 75 km and then travels a distance of 90 km at an average speed of 10 km/h more than the first speed. If it takes 3 hours to complete the total journey, find its first speed



[View Text Solution](#)

30. The difference between two natural numbers is 5 and the difference between their reciprocals is $\frac{5}{14}$ Find the numbers.



[View Text Solution](#)

31. A two-digit number is such that the product of its digits is 20. If 9 is added to the number, the digits interchange their places. Find the number



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Evaluation and Analysis Based Question

1. An equation has been given as $\frac{c}{x^2} + \frac{k}{x} = 1$

Find the relation between c and k , if

x has real values



[View Text Solution](#)

2. An equation has been given as $\frac{c}{x^2} + \frac{k}{x} = 1$

Find the relation between c and k, if

x has no real values



[View Text Solution](#)

3. If α and β are roots of a quadratic equation such that $\alpha + \beta = 2$ and $\alpha^4 + \beta^4 = 272$, then find the equation.



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



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5. Find the value of p if $\alpha^2 + \beta^2 - \alpha\beta = 3\frac{1}{4}$ where α and β are roots of quadratic equation $x^2 + px + 1 = 0$



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6. Out of a certain number of Saras birds, one-fourth the number are moving about in lotus plants, $\frac{1}{9}$ th coupled (along with $\frac{1}{4}$ th as well as 7 times the square root of the number move on a hill, 56 birds remain in Vacula tree. What is the total number of birds?



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7. 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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8. 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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9. 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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10. Find three consecutive positive integers whose product is equal to sixteen times their sum.



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Assertion and Reasoning Based Question

1. Assertion: If a and b are integers and the roots of $x^2 + ax + b = 0$ are rational then they must be integers.

Reason: If the coefficient of x^2 in a quadratic equation is unity then its roots must be integers.

A. Both the Assertion and the Reason are correct and

Reason is the correct explanation of the Assertion.

B. Both the Assertion and the Reason are correct but

Reason is not the correct explanation of the Assertion.

C. Assertion is true but Reason is false.

D. Both Assertion and Reason are false

Answer: C



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2. Assertion: If $f(x)$ is a quadratic expression such that $f(1) + f(2) = 0$. If α is a root of $f(x) = 0$, then the other root is 8α .

Reason: If $f(x) = ax^2 + bx + c$ then

$$\alpha + \beta = -\frac{b}{a} \quad \& \quad \alpha\beta = \frac{c}{a}$$

A. Both the Assertion and the Reason are correct and

Reason is the correct explanation of the Assertion.

- B. Both the Assertion and the Reason are correct but Reason is not the correct explanation of the Assertion.
- C. Assertion is true but Reason is false.
- D. Both Assertion and Reason are false.

Answer: B



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Case Based Question

1. Chandana and Sohana are very close friends. Chandana's parents own a Maruti Alto. Sohana's parents own a Toyota Livo. Both the families decided to go for to Somanath temple in Gujrat by their own cars.
- Chandana's car travels x km/hr while Sohana's car travels 5 km/h

more than Chandana's car. Nidhi's car took 4 hrs more than Ria's car in covering 400 km.

What will be distance covered by Sohana's car in two hour?

A. $2(x + 5)$ km

B. $(x + 5)$ km

C. $2(x + 10)$ km

D. $(2x + 5)$ km

Answer: A



[View Text Solution](#)

2. Chandana and Sohana are very close friends. Chandana's parents own a Maruti Alto. Sohana's parents own a Toyota Livo. Both the families decided to go for to Somanath temple in

Gujrat by their own cars.

Chandana's car travels x km/hr while Sohana's car travels 5 km/h more than Chandana's car. Nidhi's car took 4 hrs more than Ria's car in covering 400 km.

Which of the following quadratic equation describe the speed of Chandana's car?

A. $x^2 - 5x - 500 = 0$

B. $x^2 + 4x - 400 = 0$

C. $x^2 + 5x - 500 = 0$

D. $x^2 - 4x + 400 = 0$

Answer: C



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3. Chandana and Sohana are very close friends. Chandana's parents own a Maruti Alto. Sohana's parents own a Toyota Livo. Both the families decided to go for to Somanath temple in Gujrat by their own cars.

Chandana's car travels x km/hr while Sohana's car travels 5 km/h more than Chandana's car. Nidhi's car took 4 hrs more than Ria's car in covering 400 km.

What is the speed of Chandana's car?

- A. 20 km/hour
- B. 15 km/hour
- C. 25 km/hour
- D. 10 km/hour

Answer: A



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4. Chandana and Sohana are very close friends. Chandana's parents own a Maruti Alto. Sohana's parents own a Toyota Livo. Both the families decided to go for to Somanath temple in Gujrat by their own cars.

Chandana's car travels x km/hr while Sohana's car travels 5 km/h more than Chandana's car. Nidhi's car took 4 hrs more than Ria's car in covering 400 km.

How much time took Sohana to travel 400 km ?

- A. 20 hour
- B. 40 hour
- C. 25 hour
- D. 16 hour

Answer: D



5. Chandana and Sohana are very close friends. Chandana's parents own a Maruti Alto. Sohana's parents own a Toyota Livo. Both the families decided to go for to Somanath temple in Gujrat by their own cars.

Chandana's car travels x km/hr while Sohana's car travels 5 km/h more than Chandana's car. Nidhi's car took 4 hrs more than Ria's car in covering 400 km.

How much time took Chandana to travel 400 km?

- A. 15 hour
- B. 18 hour
- C. 20 hour
- D. 16 hour

Answer: B



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6. Riya has a field with a flowerbed and grass land. The grass land is in the shape of rectangle while flowerbed is in the shape of square. This length of the grassland is found to be 3 m more than twice the length of the flowerbed. Total area of the whole land is $1260m^2$.

If the length of the flowerbed is x m then what is the total length of the field ?

A. $(2x + 3)$ m

B. $(3x + 3)$ m

C. $6x$ m

D. $(2x + 5)$ m

Answer: B



View Text Solution

7. Riya has a field with a flowerbed and grass land. The grass land is in the shape of rectangle while flowerbed is in the shape of square. This length of the grassland is found to be 3 m more than twice the length of the flowerbed. Total area of the whole land is $1260m^2$.

What will be small perimeter of the whole field?

A. $(8x + 6)$ m

B. $(6x + 8)$ m

C. $(4x + 3)$ m

D. $(4x + 3)$ m

Answer: A



View Text Solution

8. Riya has a field with a flowerbed and grass land. The grass land is in the shape of rectangle while flowerbed is in the shape of square. This length of the grassland is found to be 3 m more than twice the length of the flowerbed. Total area of the whole land is $1260m^2$.

What is value of x if the area of total field is $1260 m^2$?

A. 21 m

B. 10 m

C. 20 m

D. 15 m

Answer: C



View Text Solution

9. Riya has a field with a flowerbed and grass land. The grass land is in the shape of rectangle while flowerbed is in the shape of square. This length of the grassland is found to be 3 m more than twice the length of the flowerbed. Total area of the whole land is $1260m^2$.

The area of grassland is :

A. $180m^2$

B. $360m^2$

C. $400m^2$

D. $860m^2$

Answer: C



View Text Solution

10. Riya has a field with a flowerbed and grass land. The grass land is in the shape of rectangle while flowerbed is in the shape of square. This length of the grassland is found to be 3 m more than twice the length of the flowerbed. Total area of the whole land is $1260m^2$.

The ratio of area of flowerbed to area of grassland ?

A. $\frac{20}{43}$

B. $\frac{23}{40}$

C. $\frac{26}{43}$

D. $\frac{23}{46}$

Answer: A



[View Text Solution](#)

11. In an auditorium, seats are arranged in rows and columns. The number of rows were equal to the number of seats in each row was reduced by 10, the total number of seats increased by 300.

If x is taken as number of row in original arrangement which of the following quadratic equation describe the situation ?

A. $x^2 - 20x - 300 = 0$

B. $x^2 + 20x - 300 = 0$

C. $x^2 - 20x + 300 = 0$

D. $x^2 + 20x + 300 = 0$

Answer: A



View Text Solution

12. In an auditorium, seats are arranged in rows and columns. The number of rows were equal to the number of seats in each row was reduced by 10, the total number of seats increased by 300.

How many number of rows are there in the original arrangement ?

A. 20

B. 40

C. 10

D. 30

Answer: D



View Text Solution

13. In an auditorium, seats are arranged in rows and columns. The number of rows were equal to the number of seats in each row was reduced by 10, the total number of seats increased by 300.

How many number of seats are there in the auditorium in original arrangement ?

A. 725

B. 400

C. 900

D. 680

Answer: C



View Text Solution

14. In an auditorium, seats are arranged in rows and columns. The number of rows were equal to the number of seats in each row was reduced by 10, the total number of seats increased by 300.

How many number of seats are there in the auditorium after rearrangement.

- A. 860
- B. 990
- C. 1200
- D. 680

Answer: C



[View Text Solution](#)

15. In an auditorium, seats are arranged in rows and columns. The number of rows were equal to the number of seats in each row was reduced by 10, the total number of seats increased by 300.

How many number of columns are there in the auditorium after rearrangement ?

A. 42

B. 20

C. 25

D. 32

Answer: B



View Text Solution

16. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of Quadratic questions. So he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$.

How, factorize each of the following quadratic equations and find the roots.

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

A. 1, 6

B. $\frac{1}{2}, \frac{-2}{3}$

C. $\frac{1}{3}, \frac{-1}{2}$

D. $\frac{3}{2}, -2$

Answer: B



[View Text Solution](#)

17. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of Quadratic questions. So he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$.

How, factorize each of the following quadratic equations and find the roots.

$$2x^2 + x - 300 = 0$$

A. $30, \frac{2}{15}$

B. $60, \frac{2}{5}$

C. $12, \frac{-25}{2}$

D. None of these

Answer: C



View Text Solution

18. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of Quadratic questions. So he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$.

How, factorize each of the following quadratic equations and find the roots.

$$x^2 - 8x + 16 = 0$$

A. 3,3

B. 3,-3

C. 4,-4

D. 4,4

Answer: D



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19. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of Quadratic questions. So he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$.

How, factorize each of the following quadratic equations and find the roots.

$$6x^2 - 13x + 5 = 0$$

A. $2, \frac{3}{5}$

B. $-2, \frac{-5}{3}$

C. $\frac{1}{2}, \frac{-3}{5}$

D. $\frac{-1}{10}, \frac{-1}{10}$

Answer: D



[View Text Solution](#)

20. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of Quadratic questions. So he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$.

How, factorize each of the following quadratic equations and find the roots.

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

A. $\frac{1}{10}, \frac{1}{10}$

B. $-10, -10$

C. $-10, \frac{1}{10}$

D. $\frac{-1}{10}, \frac{-1}{10}$

Answer: A



[View Text Solution](#)

21. If $p(x)$ is a quadratic polynomial i.e., $p(x) = ax^2 + bx + c$, $a \neq 0$, then $p(x) = 0$ is called a quadratic equation. Now, answer the following questions.

Which of the following is correct about the quadratic equation $ax^2 + bx + c = 0$?

- A. a, b and c are real numbers, $c \neq 0$
- B. a, b and c are rational numbers, $a \neq 0$
- C. a, b and c are integers, a, b and $c \neq 0$
- D. a, b and c real numbers, $a \neq 0$

Answer: D



[View Text Solution](#)

22. If $p(x)$ is a quadratic polynomial i.e., $p(x) = ax^2 + bx + c, a \neq 0$, then $p(x) = 0$ is called a quadratic equation. Now, answer the following questions.

The degree of a quadratic equation is :

A. 1

B. 2

C. 3

D. other than 1

Answer: B



[View Text Solution](#)

23. If $p(x)$ is a quadratic polynomial i.e., $p(x) = ax^2 + bx + c$, $a \neq 0$, then $p(x) = 0$ is called a quadratic equation. Now, answer the following questions.

Which of the following is a quadratic equation?

A. $x(x + 3) + 7 = 5x - 11$

B. $(x - 1)^2 - 9 = (x - 4)(x + 3)$

C. $x^2(2x + 1) - 4 = 5x^2 - 10$

D. $x(x - 1)(x + 7) = x(6x - 9)$

Answer: C



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24. If $p(x)$ is a quadratic polynomial i.e., $p(x) = ax^2 + bx + c$, $a \neq 0$, then $p(x) = 0$ is called a quadratic

equation. Now, answer the following questions.

Which of the following is incorrect about the quadratic equation $ax^2 + bx + c = 0$?

A. If $a\alpha^2 + b\alpha + c = 0$, then $x = -\alpha$ is the solution of the given quadratic equation.

B. The additive inverse of zeroes of the polynomial $ax^2 + bx + c$ is the roots of the given equation.

C. If α is a root of the given quadratic equation, then its other root is $-\alpha$

D. All of the above

Answer: D



View Text Solution

25. If $p(x)$ is a quadratic polynomial i.e., $p(x) = ax^2 + bx + c, a \neq 0$, then $p(x) = 0$ is called a quadratic equation. Now, answer the following questions.

Which of the following is not a method of finding solutions of the given quadratic equation ?

- A. Factorisation method
- B. Completing the square method
- C. Formula method
- D. None of the above

Answer: D



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26. Rahul and Aryan are good friends. They decided go to Panipat by their own vehicles. Rahul's automotive travels at a velocity of x km/h whereas Aryan's automotive travels 5 km/h faster than Rahul's automotive. Rahul took 4 hours more than Aryan to finish the journey of 400 km.

What would be the distance covered by Aryan's automotive in two hours?

A. $2(x + 5)$ km

B. $(x - 5)$ km

C. $2(x + 10)$ km

D. $(2x + 5)$ km

Answer: A



[View Text Solution](#)

27. Rahul and Aryan are good friends. They decided go to Panipat by their own vehicles. Rahul's automotive travels at a velocity of x km/h whereas Aryan's automotive travels 5 km/h faster than Rahul's automotive. Rahul took 4 hours more than Aryan to finish the journey of 400 km.

which of the given quadratic equation describe the velocity of Rahul's automotive ?

A. $x^2 - 5x - 500 = 0$

B. $x^2 + 4x - 400 = 0$

C. $x^2 + 5x - 500 = 0$

D. $x^2 - 4x + 400 = 0$

Answer: C



View Text Solution

28. Rahul and Aryan are good friends. They decided go to Panipat by their own vehicles. Rahul's automotive travels at a velocity of x km/h whereas Aryan's automotive travels 5 km/h faster than Rahul's automotive. Rahul took 4 hours more than Aryan to finish the journey of 400 km.

What is the velocity of Rahul's automotive?

- A. 20 km/hour
- B. 15 km/hour
- C. 25 km/hour
- D. 10 km/hour

Answer: A



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29. Rahul and Aryan are good friends. They decided go to Panipat by their own vehicles. Rahul's automotive travels at a velocity of x km/h whereas Aryan's automotive travels 5 km/h faster than Rahul's automotive. Rahul took 4 hours more than Aryan to finish the journey of 400 km.

How much time Aryan took to complete the journey of 400 km?

A. 20 hours

B. 40 hours

C. 25 hours

D. 16 hours

Answer: D



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30. Rahul and Aryan are good friends. They decided go to Panipat by their own vehicles. Rahul's automotive travels at a velocity of x km/h whereas Aryan's automotive travels 5 km/h faster than Rahul's automotive. Rahul took 4 hours more than Aryan to finish the journey of 400 km.

What is the relation between velocity, distance and time ?

A. $\text{Velocity} = \frac{\text{Distance}}{\text{Time}}$

B. $\text{Distance} = \frac{\text{Velocity}}{\text{Time}}$

C. $\text{Time} = \text{Velocity} \times \text{Distance}$

D. $\text{Velocity} = \text{Distance} \times \text{Time}$

Answer: B



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31. The velocity of a motorboat is 20 km/hr. For protecting the space of 15 km the boat took 1 hour extra for upstream than downstream.

Let velocity of the stream be x km/hr, then velocity of the motorboat is upstream shall be:

- A. 20 km/hr
- B. $(20 + x)$ km/hr
- C. $(20 - x)$ km/hr
- D. 2 km/hr

Answer: C



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32. The velocity of a motorboat is 20 km/hr. For protecting the space of 15 km the boat took 1 hour extra for upstream than downstream.

What is the relation between velocity, distance and time?

A. $\text{Velocity} = \frac{\text{Distance}}{\text{Time}}$

B. $\text{Distance} = \frac{\text{Velocity}}{\text{Time}}$

C. $\text{time} = \text{velocity} \times \text{distance}$

D. $\text{velocity} = \text{distance} \times \text{time}$

Answer: B



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33. The velocity of a motorboat is 20 km/hr. For protecting the space of 15 km the boat took 1 hour extra for upstream than

downstream.

Which is the correct quadratic equation for the given situation?

A. $x^2 + 30x - 200 = 0$

B. $x^2 + 20x - 400 = 0$

C. $x^2 + 30x - 400 = 0$

D. $x^2 - 30x - 400 = 0$

Answer: C



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34. The velocity of a motorboat is 20 km/hr. For protecting the space of 15 km the boat took 1 hour extra for upstream than downstream.

What is the velocity of the motorboat in the still water?

A. 20 km/hour

B. 10 km/hour

C. 15 km/hour

D. 25 km/hour

Answer: B



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35. The velocity of a motorboat is 20 km/hr. For protecting the space of 15 km the boat took 1 hour extra for upstream than downstream.

How much time a boat took in downstream to cover the distance :

A. 90 minutes

B. 15 minutes

C. 30 minutes

D. 45 minutes

Answer: C



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36. Point A and B representing Chandigarh and Kurukshetra respectively are almost 90 km apart from each other on the highway. A car starts from Chandigarh and another from Kurukshetra at the same time. If these cars go in the same direction they meet in 9 hours and if these cars go in opposite direction, they meet in $9/7$ hours. Let X and Y be two cars starting from points A and B respectively and their speed be x km/hr and y km/hr.

Then, answer the following questions,

When both cars move in the same direction, then the situation can be represented algebraically as :

A. $x - y = 10$

B. $x + y = 10$

C. $x + y = 9$

D. $x - y = 9$

Answer: A



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37. Point A and B representing Chandigarh and Kurukshetra respectively are almost 90 km apart from each other on the highway. A car starts from Chandigarh and another from

Kurukshetra at the same time. If these cars go in the same direction they meet in 9 hours and if these cars go in opposite direction, they meet in $9/7$ hours. Let X and Y be two cars starting from points A and B respectively and their speed be x km/hr and y km/hr.

Then, answer the following questions,

When both cars move in opposite direction, then the situation can be represented algebraically as

A. $x - 7 = 70$

B. $x + 7 = 90$

C. $x + y = 70$

D. $x + y = 10$

Answer: C



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38. Point A and B representing Chandigarh and Kurukshetra respectively are almost 90 km apart from each other on the highway. A car starts from Chandigarh and another from Kurukshetra at the same time. If these cars go in the same direction they meet in 9 hours and if these cars go in opposite direction, they meet in $9/7$ hours. Let X and Y be two cars starting from points A and B respectively and their speed be x km/hr and y km/hr.

Then, answer the following questions,

Speed of car X is :

- A. 30 kmhr
- B. 40 kmhr
- C. 50 kmhr
- D. 60 kmhr

Answer: B



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39. Point A and B representing Chandigarh and Kurukshetra respectively are almost 90 km apart from each other on the highway. A car starts from Chandigarh and another from Kurukshetra at the same time. If these cars go in the same direction they meet in 9 hours and if these cars go in opposite direction, they meet in $9/7$ hours. Let X and Y be two cars starting from points A and B respectively and their speed be x km/hr and y km/hr.

Then, answer the following questions,

Speed of car Y is

A. 50 km/hr

B. 40 km/hr

C. 30 km/hr

D. 60 km/hr

Answer: C



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40. Point A and B representing Chandigarh and Kurukshetra respectively are almost 90 km apart from each other on the highway. A car starts from Chandigarh and another from Kurukshetra at the same time. If these cars go in the same direction they meet in 9 hours and if these cars go in opposite direction, they meet in $9/7$ hours. Let X and Y be two cars starting from points A and B respectively and their speed be x km/hr and y km/hr.

Then, answer the following questions,

If the speed of car X and car Y, each is increased by 10 km/hr, and cars are moving in opposite direction, then after how much time they will meet?

- A. 5 hrs
- B. 4 hrs
- C. 2 hrs
- D. 1 hr

Answer: D



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41. A quadratic equation can be defined as an equation of degree 2. This means that the highest exponent of the

polynomial in it is 2. The standard form of a quadratic equation is $ax^2 + bx + c = 0$, where a , b and c are real numbers are $a \neq 0$

Every quadratic equation has two roots depending of the nature of its discriminant, $D = b^2 - 4ac$. Based on the above information, answer the following questions.

Which of the following quadratic equation have no real roots?

A. $-4x^2 + 7x - 4 = 0$

B. $-4x^2 + 7x - 2 = 0$

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

D. $3x^2 + 6x + 2 = 0$

Answer: A



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42. A quadratic equation can be defined as an equation of degree 2. This means that the highest exponent of the polynomial in it is 2. The standard form of a quadratic equation is $ax^2 + bx + c = 0$, where a , b and c are real numbers are $a \neq 0$

Every quadratic equation has two roots depending of the nature of its discriminant, $D = b^2 - 4ac$. Based on the above information, answer the following questions.

Which of the following quadratic equation have rational roots ?

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

B. $x^2 - 5x + 6 = 0$

C. $4x^2 - 3x - 2 = 0$

D. $6x^2 - x + 11 = 0$

Answer: B



43. A quadratic equation can be defined as an equation of degree 2. This means that the highest exponent of the polynomial in it is 2. The standard form of a quadratic equation is $ax^2 + bx + c = 0$, where a , b and c are real numbers are $a \neq 0$

Every quadratic equation has two roots depending of the nature of its discriminant, $D = b^2 - 4ac$. Based on the above information, answer the following questions.

Which of the following quadratic equation have irrational roots?

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

B. $4x^2 - 7x + 3 = 0$

C. $6x^2 - 3x - 5 = 0$

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

Answer: C



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44. A quadratic equation can be defined as an equation of degree 2. This means that the highest exponent of the polynomial in it is 2. The standard form of a quadratic equation is $ax^2 + bx + c = 0$, where a , b and c are real numbers are $a \neq 0$

Every quadratic equation has two roots depending of the nature of its discriminant, $D = b^2 - 4ac$. Based on the above information, answer the following questions.

Which of the following quadratic equations have equal roots?

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

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

C. $5x^2 - 10x + 1 = 0$

D. $9x^2 + 6x + 1 = 0$

Answer: D



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45. A quadratic equation can be defined as an equation of degree 2. This means that the highest exponent of the polynomial in it is 2. The standard form of a quadratic equation is $ax^2 + bx + c = 0$, where a , b and c are real numbers are $a \neq 0$

Every quadratic equation has two roots depending of the nature of its discriminant, $D = b^2 - 4ac$. Based on the above information, answer the following questions.

Which of the following quadratic equations has two distinct equal roots?

A. $x^2 + 3x + 1 = 0$

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

C. $4x^2 + 8x + 4 = 0$

D. $3x^2 + 6x + 4 = 0$

Answer: A



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46. In our daily life we use quadratic formula as for calculating areas, determining a product's profit or formulating the speed of an object and many more.

Based on the above information, answer the following

questions :

If the roots of the quadratic equation are 2,-3, then its equation is :

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

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

C. $2x^2 - 3x + 1 = 0$

D. $x^2 - 6x - 1 = 0$

Answer: B



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47. In our daily life we use quadratic formula as for calculating areas, determining a product's profit or formulating the speed of an object and many more.

Based on the above information, answer the following questions :

If one root of the quadratic equation $2x^2 + kx + 1 = 0$ is $\frac{-1}{2}$,

then $k =$

A. 3

B. -5

C. -3

D. 5

Answer: A



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48. In our daily life we use quadratic formula as for calculating areas, determining a product's profit or formulating the speed

of an object and many more.

Based on the above information, answer the following questions :

Which of the following quadratic equation has equal and opposite roots?

A. $x^2 - 4 = 0$

B. $16x^2 - 9 = 0$

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

D. Both (a) and (b)

Answer: D



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49. In our daily life we use quadratic formula as for calculating areas, determining a product's profit or formulating the speed of an object and many more.

Based on the above information, answer the following questions :

Which of the following quadrat equation can be represented as

$$(x - 2)^2 + 19 = 0?$$

A. $x^2 + 4x - 15 = 0$

B. $x^2 - 4x + 15 = 0$

C. $x^2 - 4x - 23 = 0$

D. $x^2 + 4x + 23 = 0$

Answer: C



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50. In our daily life we use quadratic formula as for calculating areas, determining a product's profit or formulating the speed of an object and many more.

Based on the above information, answer the following questions :

If one root of a quadratic equation is $1 + 5\sqrt{7}$

A. $1 + 5\sqrt{7}$

B. $1 - 5\sqrt{7}$

C. $-1 + 5\sqrt{7}$

D. $-1 - 5\sqrt{7}$

Answer: B



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51. Quadratic equations started around 3000 B.C. with the Babylonians. They were one of the world's first civilisation, and came up with some great ideas like agriculture, irrigation and writing. There were many reasons why Babylonians needed to solve quadratic equations. For example, to know what amount of crop you can grow on the square field. Based on the above information, represent the following questions in the form of quadratic equation.

The sum of squares of two consecutive integers is 650 :

A. $x^2 + 2x - 650 = 0$

B. $2x^2 + 2x - 649 = 0$

C. $x^2 - 2x - 650 = 0$

D. $2x^2 + 6x - 550 = 0$

Answer: B



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52. Quadratic equations started around 3000 B.C. with the Babylonians. They were one of the world's first civilisation, and came up with some great ideas like agriculture, irrigation and writing. There were many reasons why Babylonians needed to solve quadratic equations. For example, to know what amount of crop you can grow on the square field. Based on the above information, represent the following questions in the form of quadratic equation.

The sum of two numbers is 15 and the sum of their reciprocals is $\frac{3}{10}$

A. $x^2 + 10x - 150 = 0$

B. $15x^2 - x + 150 = 0$

C. $x^2 - 15x + 50 = 0$

$$D. 3x^2 - 10x + 15 = 0$$

Answer: C



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53. Quadratic equations started around 3000 B.C. with the Babylonians. They were one of the world's first civilisation, and came up with some great ideas like agriculture, irrigation and writing. There were many reasons why Babylonians needed to solve quadratic equations. For example, to know what amount of crop you can grow on the square field. Based on the above information, represent the following questions in the form of quadratic equation.

Two numbers differ by 3 and their product is 504 :

$$A. 3x^2 - 504 = 0$$

B. $x^2 - 504x + 3 = 0$

C. $504x^2 + 3 = x$

D. $x^2 + 3x - 504 = 0$

Answer: D



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54. Quadratic equations started around 3000 B.C. with the Babylonians. They were one of the world's first civilisation, and came up with some great ideas like agriculture, irrigation and writing. There were many reasons why Babylonians needed to solve quadratic equations. For example, to know what amount of crop you can grow on the square field. Based on the above information, represent the following questions in the form of quadratic equation.

A natural number whose square diminished by 84 is thrice of 8 more of given number

A. $x^2 + 8x - 84 = 0$

B. $3x^2 - 84x + 3 = 0$

C. $x^2 - 3x - 108 = 0$

D. $x^2 - 11x + 60 = 0$

Answer: C



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55. Quadratic equations started around 3000 B.C. with the Babylonians. They were one of the world's first civilisation, and came up with some great ideas like agriculture, irrigation and writing. There were many reasons why Babylonians needed to

solve quadratic equations. For example, to know what amount of crop you can grow on the square field. Based on the above information, represent the following questions in the form of quadratic equation.

A natural number when increased by 12, equals 160 times its reciprocal :

A. $x^2 + 12x + 160 = 0$

B. $x^2 - 160x + 12 = 0$

C. $12x^2 - x - 160 = 0$

D. $x^2 + 12x - 160 = 0$

Answer: D



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56. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of quadratic equations. So, he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$

$$\therefore ax^2 + bx + c = (px + q)(rx + s) = prx^2 + (ps + qr)x + qs.$$

Now, factorize each of the following quadratic equations and find their roots.

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

A. 1,6

B. $\frac{1}{2}, \frac{-2}{3}$

C. $\frac{1}{3}, \frac{-1}{2}$

D. $\frac{3}{2}, -2$

Answer: B



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57. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of quadratic equations. So, he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$

$$\therefore ax^2 + bx + c = (px + q)(rx + s) = prx^2 + (ps + qr)x + qs.$$

Now, factorize each of the following quadratic equations and find their roots.

$$2x^2 + x - 300 = 0$$

A. 30, $\frac{21}{5}$

B. 60, $\frac{-2}{5}$

C. 12, $\frac{-25}{2}$

D. None of these

Answer: C



58. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of quadratic equations. So, he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$

$$\therefore ax^2 + bx + c = (px + q)(rx + s) = prx^2 + (ps + qr)x + qs.$$

Now, factorize each of the following quadratic equations and find their roots.

$$x^2 - 8x + 16 = 0$$

A. 3,3

B. 3,-3

C. 4,-4

D. 4,4

Answer: D



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59. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of quadratic equations. So, he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$

$$\therefore ax^2 + bx + c = (px + q)(rx + s) = prx^2 + (ps + qr)x + qs.$$

Now, factorize each of the following quadratic equations and find their roots.

$$6x^2 - 13x + 5 = 0$$

A. $2, \frac{3}{5}$

B. $-2, \frac{5}{3}$

C. $\frac{1}{2}, \frac{-3}{5}$

D. $\frac{1}{2}, \frac{5}{3}$

Answer: D



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60. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of quadratic equations. So, he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$

$$\therefore ax^2 + bx + c = (px + q)(rx + s) = prx^2 + (ps + qr)x + qs.$$

Now, factorize each of the following quadratic equations and find their roots.

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

A. $\frac{1}{10}, \frac{1}{10}$

B. $-10, -10$

C. $-10, \frac{1}{10}$

D. $\frac{-1}{10}, \frac{-1}{10}$

Answer: A



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Passaged Based Question

1. During the battle of Mahabhart, Arjun carried some arrows for fighting with Bheeshma. With half of the arrows, he cut down the arrows thrown by Bheeshma on him and with six other arrows he killed the rath driver of Bheeshma. With one arrow each, he knocked down respectively the rath, flag and the bow of Bheeshma. Finally, with one more than four times the square root of total arrows, he laid Bheeshma unconscious on

an arrow bed. Based on above information answer the following

questions :

Find the total number of arrows Arjun had.



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2. During the battle of Mahabhart, Arjun carried some arrows for fighting with Bheeshma. With half of the arrows, he cut down the arrows thrown by Bheeshma on him and with six other arrows he killed the rath driver of Bheeshma. With one arrow each, he knocked down respectively the rath, flag and the bow of Bheeshma. Finally, with one more than four times the square root of total arrows, he laid Bheeshma unconscious on an arrow bed. Based on above information answer the following questions :

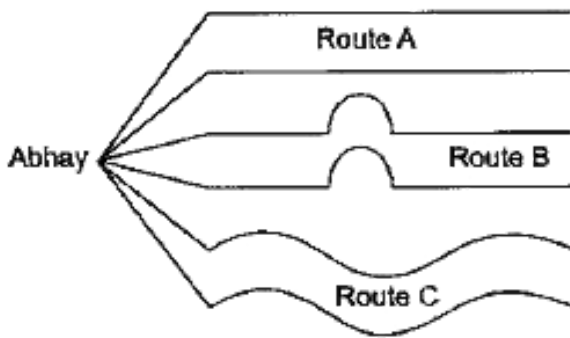
Find the number of arrows that Arjun used to lay unconscious Bheeshma.



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3. Abhay is planning a campaign. He investigates three possible routes.

- If he takes route A, which is 600 km long, he expects to cover x km per day.
- Route B, whose distance is equal to the route A, has more difficult conditions and he would only expect to cover $(x - 5)$ km per day.
- Route C, which is 200 km longer than route A, has easier conditions and he would expect to cover $(x + 5)$ km per day.



Based on the following figure and given information, answer the following questions :

Abhay takes 20 days less, if he takes route C instead of route B.

According to this statement, form an equation in x and reduce it to standard form.

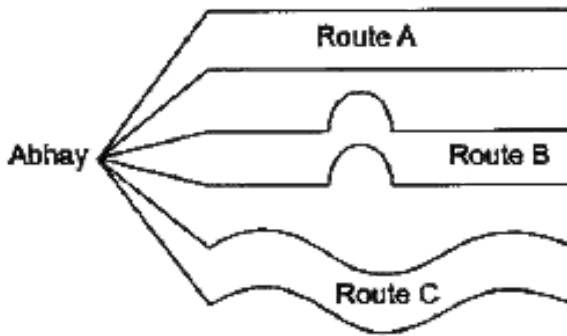


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4. Abhay is planning a campaign. He investigates three possible routes.

- If he takes route A, which is 600 km long, he expects to cover x km per day.

- Route B , whose distance is equal to the route A, has more difficult conditions and he would only expect to cover $(x - 5)$ km per day.
- Route C, which is 200 km longer than route A, has easier conditions and he would expect to cover $(x + 5)$ km per day.



Based on the following figure and given information, answer the following questions :

Find the number of days taken by Abhay, if he choose route A.



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5. In the courtyard at the back of the house. Sunita prepared a small beautiful garden. The courtyard is of square shaped whose each side is 44 m. At the centre, she prepared a square flower bed leaving a gravel path all around it. One day a friend of her visited and praised the garden a lot. She also asked for the cost of laying the flower bed and gravelling the path, then sunita told her that 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. Using the above information find :

The width of the path for gravelling.



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6. In the courtyard at the back of the house. Sunita prepared a small beautiful garden. The courtyard is of square shaped whose each side is 44 m. At the centre, she prepared a square

flower bed leaving a gravel path all around it. One day a friend of her visited and praised the garden a lot. She also asked for the cost of laying the flower bed and gravelling the path, then sunita told her that 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. Using the above information find :

The cost of laying the flower bed.



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7. In the courtyard at the back of the house. Sunita prepared a small beautiful garden. The courtyard is of square shaped whose each side is 44 m. At the centre, she prepared a square flower bed leaving a gravel path all around it. One day a friend of her visited and praised the garden a lot. She also asked for the cost of laying the flower bed and gravelling the path, then

sunita told her that 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. Using the above information find :

The cost of gravelling the path. Sol. Let the width of the gravel path be x metres.



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8. Priyanka had her birthday next week. Some of her friends plan to arrange a surprise party for her. The budget for food was 2400. But at the end moment 4 of her friends refused to come in the party. Due to this , the cost of food for each friend went up by Rs 50.

Based on the above information, answer the following questions :

How many friends planned the party?



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9. Priyanka had her birthday next week. Some of her friends plan to arrange a surprise party for her. The budget for food was 2400. But at the end moment 4 of her friends refused to come in the party Due to this , the cost of food for each friend went up by Rs 50.

Based on the above information, answer the following questions :

How many friends actually joined the party?



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10. Priyanka had her birthday next week. Some of her friends plan to arrange a surprise party for her. The budget for food was 2400. But at the end moment 4 of her friends refused to

come in the party Due to this , the cost of food for each friend went up by Rs 50.

Based on the above information, answer the following questions :

What was the final contribution each of them did?



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11. An industry produces a certain number of toys in a day. On a particular day, the cost of production of each toy was 9 less than twice the number of toys produced on that day. The total cost of production on that day was Rs 143. Based on the given information, answer the following questions :

Find the number of toys produced in the industry on that day.



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12. An industry produces a certain number of toys in a day. On a particular day, the cost of production of each toy was 9 less than twice the number of toys produced on that day. The total cost of production on that day was Rs 143. Based on the given information, answer the following questions :

What is the cost of each toy?



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13. In a society, there is a big swimming pool. It has three pipes with uniform flow to fill the swimming pool. If first two pipes operate simultaneously then they fill the pool in same time during which the pool is filled by the third pipe alone. If second pipe is operated along it fills the pool five hour faster than the first pipe and four hours slower than the third pipe. Pool is closed for monthly maintenance.

Based on the above information, answer the following questions

(i) Find the time required by each pipe to fill the pool separately.

(ii) If all the three pipes are opened simultaneously then in how much time the pool be filled?



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Self - Assessment

1. In a flight of 6000 km, an aircraft was slowed down due to bad weather. The average speed for the trip was reduced by 400 km/hr and the time of the flight was increased by 30 minutes. Find the original duration of the flight.



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2. A train travels a distance of 480 km at uniform speed. If the speed had been 8 km/hr less, 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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3. 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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4. 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 the product of the numbers of toys produced per day and 55 minus the number of toys 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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5. The height of a right-triangle is 7 cm less than the base. If the hypotenuse is 13 cm form the of the quadratic equation of find the base of the triangle .



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6. Solve : $\frac{1}{x-2} + \frac{2}{x-1} = \frac{6}{x}$



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7. Solve : $x + \frac{1}{x} = 3$ where $x \neq 0$



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8. Determine the roots of the equation $2x^2 - 6x + 3 = 0$.



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9. Find the value of k for which the equation $kx(x-2) + 6 = 0$ has real and equal roots.



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10. An express train takes 1 hour less than a passenger train to travel 132 km between Mysore and Bangalore. If the average speed of the express train is 11 km/hr more than the passenger train, find the speeds of the two trains.



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11. The sum of the reciprocals of Rehman's ages 3 years ago and 5 years hence is $\frac{1}{3}$. Find his present age.



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12. A pole has to be erected at a point on the boundary of a circular park of diameter 13 m in such a way that the difference of its distance from two diametrically opposite fixed points A and B on

the boundary is 7 metres. If it is possible to do so, at what distance from the gates should the pole be erected ?



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



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14. Two water taps together 9 hours to fill $9\frac{3}{8}$ a tank. If the tap with the larger diameter takes 10 hours lesser than the tap with the smaller diameter, then find the time in which each tap can separately fill the ta



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15. In a class test, the sum of the marks obtained by Shefali in Mathematics and English was 30. Had she secured 2 more marks in Mathematics and 3 less in English then the product of the marks in both the tests would have been 210. Find the marks obtained by her in the two subjects separately.



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16. In a flight of 6000 km, an aircraft was slowed down due to bad weather. The average speed for the trip was reduced by 400 km/hr and the time of the flight was increased by 30 minutes. Find the original duration of the flight.



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17. A train travels a distance of 480 km at uniform speed. If the speed had been 8 km/hr less, 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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18. 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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19. 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 the product of the numbers of toys produced per day and 55

minus the number of toys 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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20. The height of a right - triangle is 7 cm less than the base. If the hypotenuse is 13 cm form the quadratic equation to find the base of the triangle.

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21. Solve : $\frac{1}{x-2} + \frac{2}{x-1} = \frac{6}{x}, x \neq 0, 1, 2$

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



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23. Determine the roots of the equation $2x^2 - 6x + 3 = 0$.



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24. Find the value of k for which the equation $kx(x - 2) + 6 = 0$ has real and equal roots.



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25. An express train takes 1 hour less than a passenger train to travel 132 km between Mysore and Bangalore. If the average

speed of the express train is 11 km/hr more than the passenger train, find the speeds of the two trains.



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26. The sum of the reciprocals of Rehman's ages 3 years ago and 5 years hence is $\frac{1}{3}$ Find his present age.



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27. A pole has to be erected at a point on the boundary of a circular park of diameter 13 m in such a way that the difference of its distances from two diametrically opposite fixed gates. A and B on the boundary is 7. If it is possible to do so, at what distances from the gates should the pole be erected?



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



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29. In a class test, the sum of the marks obtained by Shefali in Mathematics and English was 30. Had she secured 2 more marks in Mathematics and 3 less in English then the product of the marks in both the tests would have been 210. Find the marks obtained by her in the two subjects separately.



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30. The nature of roots of the equation $2x^2 + \sqrt{5}x - 1 = 0$ is

- A. real and equal
- B. imaginary and equal
- C. imaginary and unequal
- D. real and unequal

Answer: D



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

- A. $k \leq 4$

B. $k < 4$

C. $k > 4$

D. $k \geq 4$

Answer: B



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32. The quadratic equation $49x^2 + 21x + \frac{9}{4} = 0$ has :

A. real and equal roots

B. four real roots

C. real and unequal roots

D. no real roots

Answer: A



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33. The roots of the equation $\sqrt{2x + 9} + x = 13$ are:

A. 8, - 20

B. 20,-8

C. - 20, - 8

D. 20,8

Answer: D



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34. For what value of k is one root of the quadratic equation

$9x^2 - 18x + k = 0$ double the other?

A. 36

B. 9

C. 12

D. 8

Answer: D



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35. Find the value of p for which the quadratic equation $(p + 1)x^2 - 6(p + 1)x + 3(p + 9) = 0, p \neq 1$ has equal roots.

Hence, find the roots of the equation.



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36. Solve: $\sqrt{7}y^2 - 6y - 13\sqrt{7} = 0$



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Multiple Choice Questions

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

A. 3

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

C. 6

D. -3

Answer: A



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2. The roots of the equation $x^2 - 3x - 9 = 0$ are:

- A. real and unequal
- B. real and equal
- C. roots are not equal
- D. imaginary roots

Answer: A



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3. The value of x in $x - \frac{18}{x} = 6$ is:

- A. real and unequal

B. real and equal

C. roots are imaginary

D. roots are not equal

Answer: A



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4. The roots of the quadratic equation $x^2 - 0.04 = 0$ are:

(a) real and unequal

A. ± 0.2

B. ± 0.02

C. 0.4

D. 2

Answer: A



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5. Value of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is:

A. 0 only

B. 4

C. 8 only

D. 0, 8

Answer: D



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6. If α and β are the zeroes of $x^2 + 5x + 8$, then the value of $\alpha + \beta$ is:

A. 5

B. 8

C. -5

D. -8

Answer: C



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7. The discriminant of the quadratic equation $3x^2 - 4x - 2 = 0$ is equal to:

A. 40

B. 20

C. 24

D. 48

Answer: A



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8. If one root of the equation $2x^2 + 3x + c = 0$ is 0.5 , then what is the value of c ?

A. - 1

B. - 2

C. - 3

D. - 4

Answer: B



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9. The equation whose roots are twice the roots of the equation

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

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

B. $x^2 - 2x + 16 = 0$

C. $x^2 - 4x + 8 = 0$

D. $x^2 - 4x + 16 = 0$

Answer: D



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10. The difference in the roots of the equation $2x^2 - 11x + 5 = 0$ is:

A. 4.5

B. 4

C. 3.5

D. 3

Answer: A



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11. In the quadratic equation $x^2 + ax + b = 0$, a and b can take any value from the set $\{1, 2, 3, 4\}$. How many pairs of values of a and b are possible in order that the quadratic equation has real roots?

A. 6

B. 8

C. 7

D. 16

Answer: B



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12. For which value of k does the pair of equations $x^2 - y^2 = 0$ and $(x-k)^2 + y^2 = 1$ yield a unique positive solution of x ?

A. 2

B. 0

C. $\sqrt{2}$

D. $-\sqrt{2}$

Answer: C



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13. If the roots of the equation $Ax^2 - Bx + C = 0$ are -1 and 1, then which one of the following is correct?

- A. A and C are both zero
- B. A and B are both positive
- C. A and C are both negative
- D. A and C are of opposite sign

Answer: D



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14. If the roots of the equation $(a^2 - bc)x^2 + 2(b^2 - ac)x + (c^2 - ab) = 0$ are equal, where $b \neq 0$, then which one of the following is correct?

A. $a + b + c = abc$

B. $a^2 + b^2 + c^2 = 0$

C. $a^3 + b^3 + c^3 = 3a$

D. $a^3 + b^3 + c^3 = 3abc$

Answer: D



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15. If one root of $(a^2 - 5a + 3)x^2 + (3a - 1)x + 2 = 0$ is twice the other, then what is the value of a ?

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

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

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

D. $-\frac{1}{3}$

Answer: A



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16. If 3 is a root of the equation $kx^2 - kx - 3 = 0$, then the value of k is

A. 3

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

C. 4

D. 2

Answer: B



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17. If the zeroes of the quadratic equation $x^2 + (a + 1)x + b + 1 = 0$ are 2 and -3, then the values of a and b are and respectively.

A. 0, 7

B. 0, - 7

C. 2, 3

D. none of these

Answer: B





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18. The roots of the equation $\sqrt{2x+9} + x = 13$ are and

A. $-8, -20$

B. $-8, 20$

C. $8, 20$

D. $8, -20$

Answer: C



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19. Which of the following is not a quadratic equation?

A. $2(x + 1)^2 = 4x^2 - 2x + 1$

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

C. $(\sqrt{2}x + \sqrt{3}x)^2 + x^2 = 3x^2 - 5x$

D. $(x^2 + 2x)^2 = x^4 + 3 + 4x^2$

Answer: D



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20. Which of the following equation has 2 as a root?

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

B. $x^2 + 3x - 12 = 0$

C. $2x^2 - 7x + 6 = 0$

D. $3x^2 - 6x - 2 = 0$

Answer: C



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21. Which one of the following is a quadratic equation?

A. $(a + 1)x^2 - \frac{3}{5}x = 11$, where $a \neq -1$

B. $(3 - x)^2 - 5 = x^2 + 2x + 1$

C. $8x^3 - x^2 = (x - 1)^3$

D. $-3x^2 = (2 - x)\left(3x - \frac{1}{2}\right)$

Answer: A



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22. Which of the following is a solution of quadratic equation

$$x^2 - b^2 = a(2x - a)?$$

A. $a + b$

B. $2b - a$

C. ab

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

Answer: A



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23. The roots of the quadratic equation $x^2 - 3x - m(m + 3) = 0$

, where m is a constant are:

A. $m, m + 3$

B. $-m, m + 3$

C. $m, -(m + 3)$

D. $-m, -(m + 3)$

Answer: B



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24. The general form of a quadratic equation is:

A. $ax^2 + bx + c$

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

C. $a^2x + b$

D. $ax^2 + bx + c = 0, a \neq 0$

Answer: D



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25. The number of possible solutions of a quadratic equation are:

- A. exactly two
- B. at most two
- C. at least two
- D. none of these

Answer: D



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26. If α, β are the roots of $x^2 + px + q = 0$, then the value of

$\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$ is:

A. $\frac{p^2 - 2q}{q}$

B. $\frac{2q - p^2}{q}$

C. $\frac{p^2 + 2q}{q}$

D. none of these

Answer: A



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27. If the sum of the roots of an equation is 6 and one root is

$3 - \sqrt{5}$, then the equation is:

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

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

C. $x^2 - 6x + 5 = 0$

D. none of the above

Answer: A



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28. The quadratic equation whose roots are $a, \frac{1}{a}$ is :

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

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

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

D. none of the above

Answer: A



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29. Find the values of k for which the quadratic equation $kx(x - 3) + 9 = 0$ has real equal roots:

A. $k = 0$ or $k = 4$

B. $k = 1$ or $k = 4$

C. $k = -3$ or $k = 3$

D. $k = -4$ or $k = 4$

Answer: A



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30. The sum of a number and its reciprocal is $\frac{10}{3}$ Find the number:

A. 3

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

C. both (a) and (c)

D. none of the above

Answer: C



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31. The condition for the sum and the product of the roots of the quadratic equation $ax^2 - bx + c = 0$ to be equal, is:

A. $b + c = 0$

B. $b - c = 0$

C. $a + c = 0$

D. $a + b + c = 0$

Answer: B



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32. Find the value of $\sqrt{30 + \sqrt{30 + \sqrt{30 + \dots \infty}}}$

A. 6

B. -5

C. Either (a) or (b)

D. Neither (a) nor (b)

Answer: A



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33. The roots of $x^2 - (a + 1)x + b^2 = 0$ are equal. Then choose the correct value of a and b from the following options:

A. 5, 2

B. 3,4

C. 5, - 3

D. 5, 4

Answer: C



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34. The solution of the equation $x^2 + x + 1 = 1$ is:

A. $x = 0, -1$

B. $x = -1, 2$

C. $x = 0, 1$

D. cannot be determined

Answer: A



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35. The roots of the equation $x^2 + 5x + 1 = 0$ are:

A. $\frac{5 + \sqrt{21}}{2}, \frac{5 - \sqrt{21}}{2}$

B. $\frac{-5 + \sqrt{21}}{2}, \frac{5 + \sqrt{21}}{2}$

C. $\frac{-5 + \sqrt{21}}{2}, \frac{-5 - \sqrt{29}}{2}$

D. $\frac{-5 + \sqrt{21}}{2}, \frac{-5 - \sqrt{21}}{2}$

Answer: C



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36. The age of a father is 25 years more than his son's age. The product of their ages is 84 in years. What will be son's age after 10 years?

A. 3

B. 28

C. 13

D. 18

Answer: C



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Very Short Answer Type Questions

1. Find the nature of roots of the quadratic equation

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



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2. For what values of k , the roots of the equation

$$x^2 + 4x + k = 0$$
 are real?



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3. The solution of a quadratic equation is as follows:

$$x = \frac{8 \pm \sqrt{(-8)^2 - 4(3)(2)}}{2(3)}$$

Then , find the quadratic equation



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



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



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6. Solve for x : $\sqrt{6x + 7} - (2x - 7) = 0$



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7. Solve: $12abx^2 - (9a^2 - 8b^2)x - 6ab = 0$.



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



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9. A teacher on attempting to arrange the students for mass drill in the form of a solid square found that 24 students were left. When he increased the square by one row and one column, he was short of 25 students. Find the number of students.



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10. Solve: $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$



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11. Find the value of k for which the roots of the equation $3x^2 - 10x + k = 0$ are reciprocal of each other.



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12. If the quadratic equation $px^2 - 2\sqrt{5}px + 15 = 0$, has two equal roots, then find the value of p .



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



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14. A peacock is sitting on the top of a pillar which is 9 m high. From a point, 27 m away from the bottom of a 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 hole is the snake caught?



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15. Solve the following quadratic equation for x:

$$9x^2 - 6b^2x - (a^4 - b^4) = 0$$



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16. Write the sum of the real roots of the equation

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



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17. In there any real value of a for which equation

$$x^2 + 2x + (a^2 + 1) = 0 \text{ has real roots?}$$



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18. Write the condition to be satisfied for which equation

$ax^2 + 2bax + c = 0$ and $bx^2 - 2\sqrt{acx} + b = 0$ have equal roots.



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Short Answer Type Questions

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



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



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3. Solve for x :

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



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4. Solve : $x^2 - 4ax - b^2 + 4a^2 = 0$.



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5. The sum of two natural numbers is 8 and their product is 15.

Find the numbers.



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6. Solve: $4x^2 - 4ax + (a^2 - b^2) = 0$.



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



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8. Divide 12 into two parts such that the sum of their squares is 74.



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9. The sum of two numbers is 15 and their reciprocals is $\frac{3}{10}$. Find the numbers.



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



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11. A dealer sells a toy for Rs 24 and gains as much percent as the cost price of the toy. Find the cost price of the toy.



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12. The difference of the squares of two natural numbers is 45. The square of the smaller number is 4 times the larger number. Find the numbers.



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13. Three-eighth of the students of a class opted S for visiting an old age home. Sixteen students opted for having a nature walk. Square root of total number of students in the class opted for tree plantation in the school. The number of students

who visited the old age home is same as the number of students who went for a nature walk and did tree plantation.

Find the total number of students.



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14. A charity trust decides to build the player hall having a carpet area of 300 sq m with its length 1 m more than twice its breadth. Find the length and breadth of the hall.



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15. Students of class X collected Rs 18000. They wanted to divide it equally among a certain number of students residing in slums area. When they started distributing the amount, 20 more students from nearby slums also joined. Now each

student got Rs 240 less. Find the number of students living in the slum.



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16. The distance between Mumbai and Pune is 192 km. Travelling by the Deccan Queen, it takes 48 minutes less than another train. Calculate the speed of the Deccan Queen if the speeds of the two trains differ by 20 km/hr.



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17. The difference of the squares of two numbers is 88. If the larger number is 5 more than twice the smaller number then find the two numbers.



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18. Three consecutive natural numbers are such that the square of the middle number exceeds the difference of the squares of the other two by 60. Find the numbers.



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19. 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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Long Answer Type Questions

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



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2. Solve for x: $2\left(\frac{2x-1}{x+3}\right) - 3\left(\frac{x+3}{2x-1}\right) = 5$ where $x \neq \frac{1}{2}$,

-3.



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



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4. A shopkeeper buys some books for Rs 80. If he had bought 4 more books for the same amount then the price of each book

would have been reduced by Rs 1. Find the number of books he bought.



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5. A takes 6 days less than B to do a work. If both A and B working together can do it in 4 days, how many days will B take to finish it?



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6. Write all the values of p for which the quadratic equation $x^2 + px + 16 = 0$ has equal roots. Find the roots of the equation so obtained.



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7. Two water taps together take 6 hours to fill a tank. If the tap with the larger diameter takes 9 hours lesser than the tap with the smaller diameter, then find the time in which each tap can separately fill the tap.

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8. Solve for x :

$$\frac{1}{x+1} + \frac{3}{5x+1} = \frac{5}{x+4}, x \neq -1, -\frac{1}{5}, -4$$

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9. Solve : $\frac{x-1}{x-2} + \frac{x-3}{x-4} = \frac{10}{3}$ where $x \neq 2, 4$

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



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11. Solve for x : $x^2 + 5x - (a^2 + a - 6) = 0$.



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12. In a class test, the sum of Arun's marks in Hindi and English is 30. He had got 2 marks more in Hindi and 3 marks less in English, the product of the marks' would have been 210. Find his marks in the two subjects.



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13. 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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14. 7 years ago, Varun's age was five times the square of Swati's age. 3 years hence, Swati's age will be two-fifths of Varun's age. Find their present ages.



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15. The sum of the areas of two squares is $260 m^2$. If the difference of their perimeters is 24 m, then find the sides of the two squares.

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

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17. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shaper of an isosceles triangle with its base as the breadth of the rectangular park and of altitude 12 m. Finn the length and breadth of the rectangular park.

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18. 300 apples were distributed equally among a certain number of students. There, had been 10 more students, each would have received one apple less. Find the number of students:



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19. The total cost of a certain length of a piece of cloth is Rs 200. If the piece was 5 m longer and each metre of cloth costs Rs 2 less, the cost of the piece would have remained unchanged. How long is the piece and what is its original rate per metre?



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20. A passenger while boarding a plane hurt herself and the captain called for immediate medical attention. Thus, the plane left 30 minutes behind schedule. In order to reach its destination 1500 km away on time, the speed was increased by 100 km/hr from its usual speed. Find the usual speed.



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



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22. The difference between two natural numbers is 5 and the difference between their reciprocals is $\frac{5}{14}$. Find the numbers.



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23. A two-digit number is such that the product of its digits is 20. If 9 is added to the number, the digit interchange their places. Find the number.



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Assertion and Reasoning Based Questions

1. Assertion: If a and b are integers and the roots of $x^2 + ax + b = 0$ are rational, then they must be integers.

Reason: If the coefficient of x^2 in a quadratic equation is unity then its roots must be integers.

- A. Both the Assertion and the Reason are correct and the Reason is the correct explanation the Assertion.
- B. The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion.
- C. Assertion is true but the Reason is false.
- D. Assertion is false but the Reason is true.

Answer: C



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2. Assertion: If $f(x)$ is a quadratic expression such that $f(1) + f(2) = 0$. If -1 is a root of $f(x) = 0$, then the other root is $8/5$.

Reason: If $f(x) = ax^2 + bx + c$, then $\alpha + \beta$

$$= -b/a \text{ and } \alpha\beta = \frac{c}{a}$$

- A. Both the Assertion and the Reason are correct and the Reason is the correct explanation the Assertion.
- B. The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion.
- C. Assertion is true but the Reason is false.
- D. Assertion is false but the Reason is true.

Answer: B



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Case Based Questions

1. Chandana and Sohana are very close friends. Chandana's parents own a Maruti Alto. Sohana's parents own a Toyota Livo. Both the families decided to go Somanath temple in Gujrat by their own cars.

Chandana's car travels x km/hr while Sohana's car travels 5 km/h more than Chandana's car. Chandana car took 4 hrs more than Sohana's car in covering 400 km.

What will be the distance covered by Sohana's car in two hour?

A. $2(x + 5)$ km

B. $(x + 5)$ km

C. $2(x + 10)$ km

D. $(2x + 5)$ km

Answer: A



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2. Chandana and Sohana are very close friends. Chandana's parents own a Maruti Alto. Sohana's parents own a Toyota Livo. Both the families decided to go Somanath temple in Gujrat by their own cars.

Chandana's car travels x km/hr while Sohana's car travels 5 km/h more than Chandana's car. Chandana car took 4 hrs more than Sohana's car in covering 400 km.

Which of the following quadratic equation describe the speed of Chandana's car?

A. $x^2 - 5x - 500 = 0$

B. $x^2 + 4x - 400 = 0$

C. $x^2 + 5x - 500 = 0$

D. $x^2 - 4x + 400 = 0$

Answer: C



View Text Solution

3. Chandana and Sohana are very close friends. Chandana's parents own a Maruti Alto. Sohana's parents own a Toyota Livo. Both the families decided to go Somanath temple in Gujrat by their own cars.

Chandana's car travels x km/hr while Sohana's car travels 5 km/h more than Chandana's car. Chandana car took 4 hrs more than Sohana's car in covering 400 km.

What is the speed of Chandana's car?

- A. 20 km/hour
- B. 15 km/hour
- C. 25 km/hour

D. 10 km/hour

Answer: A



View Text Solution

4. Chandana and Sohana are very close friends. Chandana's parents own a Maruti Alto. Sohana's parents own a Toyota Livo. Both the families decided to go Somanath temple in Gujrat by their own cars.

Chandana's car travels x km/hr while Sohana's car travels 5 km/h more than Chandana's car. Chandana car took 4 hrs more than Sohana's car in covering 400 km.

How much time did Sohana's car took to travel 400 km?

A. 20 hour

B. 40 hour

C. 25 hour

D. 16 hour

Answer: D



[View Text Solution](#)

5. Chandana and Sohana are very close friends. Chandana's parents own a Maruti Alto. Sohana's parents own a Toyota Livo. Both the families decided to go Somanath temple in Gujrat by their own cars.

Chandana's car travels x km/hr while Sohana's car travels 5 km/h more than Chandana's car. Chandana car took 4 hrs more than Sohana's car in covering 400 km.

How much time did Chandana's car took to travel 400 km?

A. 15 hour

B. 18 hour

C. 20 hour

D. 16 hour

Answer: C



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6. In an auditorium, seats are arranged in rows and columns. Initially, the number of rows were equal to the number of seats in each row. When the number of rows become twice and the number of seats in each row was reduced by 10, the total number of seats increased by 300.



If x is taken as number of row in original arrangement which of the following quadratic equation describe the situation?

A. $x^2 - 20x - 300 = 0$

B. $x^2 + 20x - 300 = 0$

C. $x^2 - 20x + 300 = 0$

D. $x^2 + 20x + 300 = 0$

Answer: A



View Text Solution

7. In an auditorium, seats are arranged in rows and columns. Initially, the number of rows were equal to the number of seats in each row. When the number of rows become twice and the number of seats in each row was reduced by 10, the total number of seats increased by 300.



How many number of rows are there in the original arrangement?

A. 20

B. 40

C. 10

D. 30

Answer: D



View Text Solution

8. In an auditorium, seats are arranged in rows and columns. Initially, the number of rows were equal to the number of seats in each row. When the number of rows become twice and the number of seats in each row was reduced by 10, the total number of seats increased by 300.



How many number of seats are there in the auditorium in original arrangement?

A. 725

B. 400

C. 900

D. 680

Answer: C



[View Text Solution](#)

9. In an auditorium, seats are arranged in rows and columns. Initially, the number of rows were equal to the number of seats in each row. When the number of rows become twice and the number of seats in each row was reduced by 10, the total number of seats increased by 300.



How many number of seats are there in the auditorium after re-arrangement.

A. 860

B. 1200

C. 990

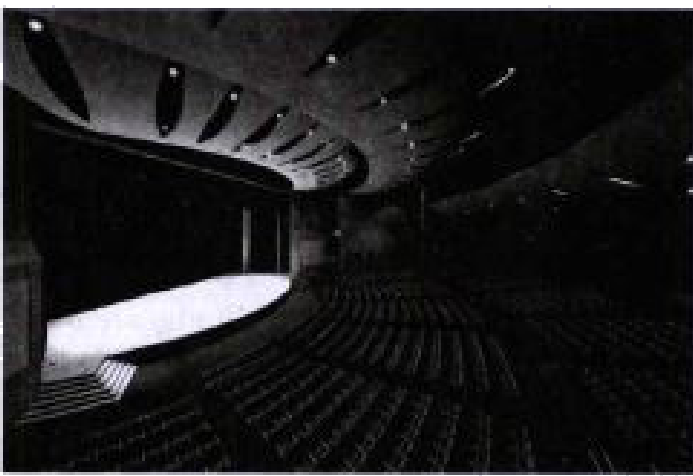
D. 680

Answer: C



View Text Solution

10. In an auditorium, seats are arranged in rows and columns. Initially, the number of rows were equal to the number of seats in each row. When the number of rows become twice and the number of seats in each row was reduced by 10, the total number of seats increased by 300.



How many number of columns are there in the auditorium after re-arrangement?

- A. 42
- B. 20
- C. 25
- D. 32

Answer: B



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11. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of Quadratic equations. So he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$.

How he factorized each of the following quadratic equations and found the roots.

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

A. 1,6

B. $\frac{1}{2}, \frac{-2}{3}$

C. $\frac{1}{3}, \frac{-1}{2}$

D. $\frac{3}{2}, -2$

Answer: B



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12. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of Quadratic equations. So he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$.

How he factorized each of the following quadratic equations and found the roots.

$$2x^2 + x - 300 = 0$$

A. $30, \frac{2}{15}$

B. $60, \frac{-2}{5}$

C. $12, \frac{-25}{2}$

D. None of these

Answer: C



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13. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of Quadratic equations. So he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$.

How he factorized each of the following quadratic equations and found the roots.

$$x^2 - 8x + 16 = 0$$

A. 3, 3

B. 3, - 3

C. 4, - 4

D. 4, 4

Answer: D



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14. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of Quadratic equations. So he started with factorization method. Let two linear factors of $ax^2 + bx + c$ be $(px + q)$ and $(rx + s)$.

How he factorized each of the following quadratic equations and found the roots.

$$6x^2 - 13x + 5 = 0$$

A. $2, \frac{3}{5}$

B. $-2, \frac{-5}{3}$

C. $\frac{1}{2}, \frac{-3}{5}$

D. $\frac{1}{2}, \frac{5}{3}$

Answer: D



15. Amit is preparing for his upcoming semester exam. For this, he has to practice the chapter of Quadratic equations. So he started with factorization method. Let two linear factors of $ax^2 + bx + c = (px + q)$ and $(rx + s)$.

How he factorized each of the following quadratic equations and found the roots.

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

A. $\frac{1}{10}, \frac{1}{10}$

B. $-10, -10$

C. $-10, \frac{1}{10}$

D. $\frac{1}{10}, \frac{1}{10}$

Answer: D



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16. If $p(x)$ is a quadratic polynomial i.e. $p(x) = ax^2 + bx + c, a \neq 0$, then $p(x) = 0$ is called a quadratic equation. Now, answer the following questions.

Which of the following is correct about the quadratic equation $ax^2 + bx + c = 0$?

- A. a, b and c are real numbers, $c \neq 0$
- B. a, b and c are rational numbers, $a \neq 0$
- C. a, b and c are integers, a, b and $c \neq 0$
- D. a, b and c real numbers, $a \neq 0$

Answer: D



[View Text Solution](#)

17. If $p(x)$ is a quadratic polynomial i.e. $p(x) = ax^2 + bx + c, a \neq 0$, then $p(x) = 0$ is called a quadratic

equation. Now, answer the following questions.

The degree of a quadratic equation is:

A. 1

B. 2

C. 3

D. other than 1

Answer: B



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18. If $p(x)$ is a quadratic polynomial i.e. $p(x) = ax^2 + bx + c, a \neq 0$, then $p(x) = 0$ is called a quadratic

equation. Now, answer the following questions.

Which of the following is a quadratic equation ?

A. $x(x + 3) + 7 = 5x - 11$

B. $(x - 1)^2 - 9 = (x - 4)(x + 3)$

C. $x^2(2x + 1) - 4 = 5x^2 - 10$

D. $x(x - 1)(x + 7) = x(6x - 9)$

Answer: A



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19. If $p(x)$ is a quadratic polynomial i.e.

$p(x) = ax^2 + bx + c, a \neq 0$, then $p(x) = 0$ is called a quadratic

equation. Now, answer the following questions.

Which of the following is incorrect about the quadratic equation $ax^2 + bx + c = 0$?

A. If $a\alpha^2 + b\alpha + c = 0$, then $x = -\alpha$ is the solution of the given quadratic equation.

B. The additive inverse of zeroes of the polynomial $ax^2 + bx + c$ is the roots of the given equation.

C. If α is a root of the given quadratic equation, then its other root is $-\alpha$

D. All of the above

Answer: D



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20. If $p(x)$ is a quadratic polynomial i.e. $p(x) = ax^2 + bx + c, a \neq 0$, then $p(x) = 0$ is called a quadratic equation. Now, answer the following questions.

Which of the following is a method of finding solutions of the given quadratic equation?

- A. Factorisation method
- B. Completing the square method
- C. Formula method
- D. All of the above

Answer: D



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21. Point A and B representing Chandigarh and Kurukshetra respectively are almost 90 km apart from each other on the highway. A car starts from Chandigarh and another from Kurukshetra at the same time. If these cars go in the same direction they meet in 9 hours and if these cars go in opposite direction, they meet in $9/7$ hours. Let X and Y be two cars starting from points A and B respectively and their speed be x km/hr and y km/hr.

Then, answer the following questions,

When both cars move in the same direction, then the situation can be represented algebraically as:

A. $x - y = 10$

B. $x + y = 10$

C. $x + y = 9$

D. $x - y = 9$

Answer: A



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22. Point A and B representing Chandigarh and Kurukshetra respectively are almost 90 km apart from each other on the highway. A car starts from Chandigarh and another from Kurukshetra at the same time. If these cars go in the same direction they meet in 9 hours and if these cars go in opposite direction, they meet in $9/7$ hours. Let X and Y be two cars starting from points A and B respectively and their speed be x km/hr and y km/hr.

Then, answer the following questions,

When both cars move in opposite direction, then

A. $x - y = 70$

B. $x + y = 90$

C. $x + y = 70$

D. $x + y = 10$

Answer: C



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23. Point A and B representing Chandigarh and Kurukshetra respectively are almost 90 km apart from each other on the highway. A car starts from Chandigarh and another from Kurukshetra at the same time. If these cars go in the same direction they meet in 9 hours and if these cars go in opposite direction, they meet in $9/7$ hours. Let X and Y be two cars starting from points A and B respectively and their speed be x km/hr and y km/hr.

Then, answer the following questions,

Speed of car X is:

A. 30 km/hr

B. 40 km/hr

C. 50 km/hr

D. 60 km/hr

Answer: B



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24. Point A and B representing Chandigarh and Kurukshetra respectively are almost 90 km apart from each other on the highway. A car starts from Chandigarh and another from Kurukshetra at the same time. If these cars go in the same

direction they meet in 9 hours and if these cars go in opposite direction, they meet in $9/7$ hours. Let X and Y be two cars starting from points A and B respectively and their speed be x km/hr and y km/hr.

Then, answer the following questions,

Speed of car Y is:

- A. 50 km/hr
- B. 40 km/hr
- C. 30 km/hr
- D. 60 km/hr

Answer: C



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25. Point A and B representing Chandigarh and Kurukshetra respectively are almost 90 km apart from each other on the highway. A car starts from Chandigarh and another from Kurukshetra at the same time. If these cars go in the same direction they meet in 9 hours and if these cars go in opposite direction, they meet in $9/7$ hours. Let X and Y be two cars starting from points A and B respectively and their speed be x km/hr and y km/hr.

Then, answer the following questions,

If the speed of car X and car Y, each is increased by 10 km/hr, and cars are moving in opposite direction, then after how much time they will meet?

A. 5 hrs

B. 4 hrs

C. 2 hrs

D. 1 hrs

Answer: D



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26. A quadratic equation can be defined as an equation of degree 2. This means that the highest exponent of the polynomial in it is 2. The standard form of a quadratic equation is $ax^2 + bx + c = 0$, where a , b and c are real numbers are $a \neq 0$

Every quadratic equation has two roots depending of the nature of its discriminant, $D = b^2 - 4ac$.

Based on the above information, answer the following questions.

Which of the following quadratic equation have no real roots?

A. $-4x^2 + 7x - 4 = 0$

B. $-4x^2 + 7x - 2 = 0$

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

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

Answer: A



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27. A quadratic equation can be defined as an equation of degree 2. This means that the highest exponent of the polynomial in it is 2. The standard form of a quadratic equation is $ax^2 + bx + c = 0$, where a , b and c are real numbers are $a \neq 0$

Every quadratic equation has two roots depending of the nature of its discriminant, $D = b^2 - 4ac$.

Based on the above information, answer the following questions.

Which of the following quadratic equation have rational roots?

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

B. $x^2 - 5x + 6 = 0$

C. $4x^2 - 3x - 2 = 0$

D. $6x^2 - x + 11 = 0$

Answer: B



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28. A quadratic equation can be defined as an equation of degree 2. This means that the highest exponent of the polynomial in it is 2. The standard form of a quadratic equation

is $ax^2 + bx + c = 0$, where a , b and c are real numbers and

$$a \neq 0$$

Every quadratic equation has two roots depending on the nature of its discriminant, $D = b^2 - 4ac$.

Based on the above information, answer the following questions.

Which of the following quadratic equations have irrational roots?

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

B. $4x^2 - 7x + 3 = 0$

C. $6x^2 - 3x - 5 = 0$

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

Answer: C



View Text Solution

29. A quadratic equation can be defined as an equation of degree 2. This means that the highest exponent of the polynomial in it is 2. The standard form of a quadratic equation is $ax^2 + bx + c = 0$, where a , b and c are real numbers are $a \neq 0$

Every quadratic equation has two roots depending of the nature of its discriminant, $D = b^2 - 4ac$.

Based on the above information, answer the following questions.

Which of the following quadratic equations has two distinct equal roots?

A. $x^2 + 3x + 1 = 0$

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

C. $4x^2 + 8x + 4 = 0$

D. $3x^2 + 6x + 4 = 0$

Answer: A



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30. In our daily life we use quadratic formula as for calculating areas, determining a product's profit or formulating the speed of an object and many more.

Based on the above information, answer the following questions :

If the roots of the quadratic equation are 2, -3, then its equation is :

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

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

C. $2x^2 - 3x + 1 = 0$

D. $x^2 - 6x - 1 = 0$

Answer: B



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31. In our daily life we use quadratic formula as for calculating areas, determining a product's profit or formulating the speed of an object and many more.

Based on the above information, answer the following questions :

If one root of the quadratic equation $2x^2 + kx + 1 = 0$ is $\frac{-1}{2}$, then $k =$

A. 3

B. -5

C. -3

D. 5

Answer: A



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32. In our daily life we use quadratic formula as for calculating areas, determining a product's profit or formulating the speed of an object and many more.

Based on the above information, answer the following questions :

Which of the following quadratic equation has equal and opposite roots?

A. $x^2 - 4 = 0$

B. $16x^2 - 9 = 0$

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

D. Both (a) and (b)

Answer: D



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33. In our daily life we use quadratic formula as for calculating areas, determining a product's profit or formulating the speed of an object and many more.

Based on the above information, answer the following questions :

Which of the following quadratic equation can be represented as $(x - 2)^2 + 19 = 0$?

A. $x^2 + 4x - 15 = 0$

B. $x^2 - 4x + 15 = 0$

C. $x^2 - 4x + 23 = 0$

D. $x^2 + 4x + 23 = 0$

Answer: C



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34. In our daily life we use quadratic formula as for calculating areas, determining a product's profit or formulating the speed of an object and many more.

Based on the above information, answer the following questions :

If one root of a quadratic equation is $1 + 5\sqrt{7}$ then the other is :

A. $1 + 5\sqrt{7}$

B. $1 - 5\sqrt{7}$

C. $-1 + 5\sqrt{7}$

D. $-1 - 5\sqrt{7}$

Answer: B



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Passage Based Questions

1. During the battle of Mahabharata, Arjun carried some arrows for fighting with Bheeshma. With half of the arrows, he cut down the arrows thrown by Bheeshma on him and with six other arrows he killed the rath driver of Bheeshma. With one arrow each, he knocked down respectively the rath, flag and the bow of Bheeshma. Finally with one more than four time the square root of total arrows, he laid Bheeshma unconscious on an arrow bed. Based on above information answer the following questions :

Find the total number of arrows Arjun had.



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2. During the battle of Mahabhart, Arjun carried some arrows for fighting with Bheeshma. With half of the arrows, he cut down the arrows thrown by Bheeshma on him and with six other arrows he killed the rath driver of Bheeshma. With one arrow each, he knocked down respectively the rath, flag and the bow of Bheeshma. Finally with one more than four time the square root of total arrows, he laid Bheeshma unconscious on an arrow bed. Based on above information answer the following questions :

Find the number of arrows that Arjun used to lay unconscious Bheeshma.



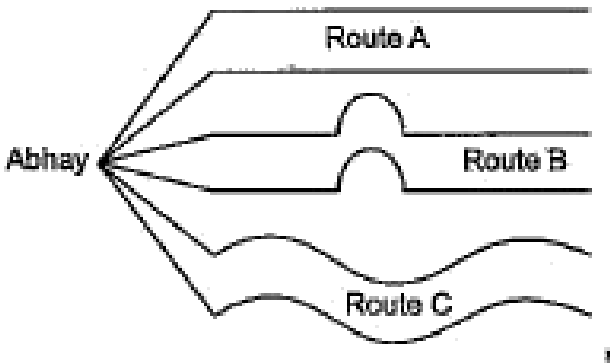
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3. Abhay is planning a campaign. He investigates three possible routes.

* If he takes route A, which is 600 km long, he expects to cover x km per day.

* Route B, whose distance is equal to the route A, has more difficult he would only expect to cover $(x-5)$ km per day.

* Route C, which is 200 km longer than route A, has easier conditions and he would expect to cover $(x+5)$ km per day.



Based on the following figure and given information, answer the following questions :

Abhay takes 20 days less, if he takes route C instead of route B.

According to this statement, form an equation in x and reduce it to standard form.



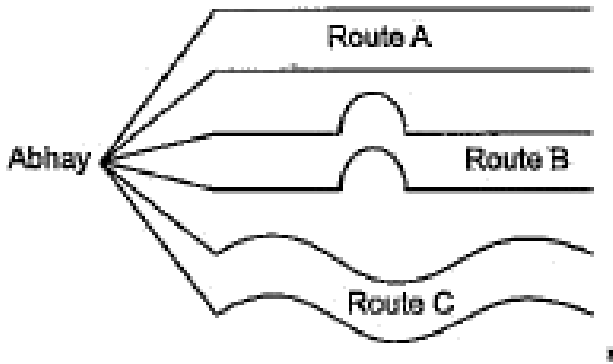
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4. Abhay is planning a campaign. He investigates three possible routes.

* If he takes route A, which is 600 km long, he expects to cover x km per day.

* Route B, whose distance is equal to the route A, has more difficult he would only expect to cover $(x-5)$ km per day.

* Route C, which is 200 km longer than route A, has easier conditions and he would expect to cover $(x+5)$ km per day.



Based on the following figure and given information, answer the following questions :

Find the number of days taken by Abhay, if he choose route A.



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5. In the courtyard at the back of the house. Sunita prepared a small beautiful garaen. Ine courtyard is of square shaped whose each side is 44 m. At the centre, she prepared a square flower bed leaving a gravel path all around it. One day a friend of her visited and praised the garden a lot. She also asked for the cost of laying the flower bed and gravelling the path, then sunita

told her that 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. Using the above information find :

The width of the path for gravelling.



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6. In the courtyard at the back of the house. Sunita prepared a small beautiful garden. The courtyard is of square shape whose each side is 44 m. At the centre, she prepared a square flower bed leaving a gravel path all around it. One day a friend of her visited and praised the garden a lot. She also asked for the cost of laying the flower bed and gravelling the path, then Sunita told her that 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. Using the above information find :

The cost of laying the flower bed.



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7. In the courtyard at the back of the house. Sunita prepared a small beautiful garden. The courtyard is of square shape whose each side is 44 m. At the centre, she prepared a square flower bed leaving a gravel path all around it. One day a friend of her visited and praised the garden a lot. She also asked for the cost of laying the flower bed and gravelling the path, then Sunita told her that 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. Using the above information find :

The cost of gravelling the path.



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8. An industry produces a certain number of toys in a day. On a particular day, the cost of production of each toy was 9 less than twice the number of toys produced on that day. The total cost of production on that day was Rs 143.

Based on the given information, answer the following questions:

What is the cost of each toy?



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9. In a society, there is a big swimming pool. It has three pipes with uniform flow to fill the swimming pool. If first two pipes operate simultaneously then they fill the pool in same time during which the pool is filled by the third pipe alone. If second pipe is operated alone it fills the pool five hour faster than the

first pipe and four hours slower than the third pipe. Pool is closed for monthly maintenance. Based on the above information, answer the following questions:

Find the time required by each pipe to fill the pool separately.



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10. In a society, there is a big swimming pool. It has three pipes with uniform flow to fill the swimming pool. If first two pipes operate simultaneously then they fill the pool in same time during which the pool is filled by the third pipe alone. If second pipe is operated alonge it fills the pool five hour faster than the first pipe and four hours slower than the third pipe. Pool is closed for monthly maintenance. Based on the above information, answer the following questions:

If all the three pipes are opened simultaneously then in how much time the pool be filled?



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