PERL EDUCATION

DPP

DAILY PRACTICE PAPER

QUADRATIC EQUATIONS

MATHEMATICS

10TH ICSE

1. Solve :
   I. $x^2 - 3x = 0$,
   II. $x^2 + 2x - 15 = 0$.
   III. $x + \frac{16}{x} = 8$.

2. The following equations by factorization method :
   I. $\frac{1}{x-2} + \frac{2}{x-1} = \frac{6}{x}$
   II. $4\sqrt{3}\,x^2 + 5x - 2\sqrt{3} = 0$
   3. $9x^4 + 20 = 29x^2$.
   4. $(x^2 - 3x)^2 - 16(x^2 - 3x) - 36 = 0$.
   5. $4^x - 3.2^{x+2} + 32 = 0$.
   6. $\sqrt{x+9} + 3 = x$.
   7. $7.2\left(x^2 + \frac{1}{x^2}\right) - 9\left(x + \frac{1}{x}\right) + 14 = 0$.
   8. $\sqrt{4-x} + \sqrt{x+9} = 5$.

9. Solve the following equations :
   I. $3x^2 - 10x + 3 = 0$
   II. $6y^2 - 35y + 50 = 0$
   III. $x + \frac{1}{x} = \frac{26}{5}$
   IV. $2x + \frac{4}{x} = 9$
   V. $3y + \frac{5}{16y} = 2$
   VI. $x^2 - 4x - 1 = 0$.
   10. $2x^2 + 2x - 3 = 0$, giving your answer, correct to one decimal place.
   11. $\frac{x-2}{x+2} + \frac{x+2}{x-2} = 4$, using formula.
   12. $4x^2 - 4ax + (a^2 - b^2) = 0$ by using formula.

13. Without determining the roots of the following equations, comment upon their nature.
   I. $x^2 - 2x + 5 = 0$
   II. $4x^2 + 4x + 1 = 0$
   III. $2x^2 + x - 3 = 0$
   IV. $2x^2 + 2x - 3 = 0$
   V. $a^2b^2y^2 + 2abc\,y + c^2 = 0, a \neq 0,\ b \neq 0$.

14. Determine the value of k such that the equation $kx^2 + 4x + 1 = 0$ has real and equal roots.

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

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

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

18. Find two consecutive positive even integers whose product is 224.

19. The sum of two numbers is 15. If the sum of their reciprocals is $\frac{3}{10}$, find the two numbers.

20. A number consists of two digits whose product is 18. When 27 is subtracted from the number, the digits change their places. Find the number.

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

22. In a school auditorium, the number of seats in each row is 8 less than the number of rows, how many seats are in each row if there are in all 609 seats in the auditorium ?

23. Some students planned a picnic. The budget for food was Rs.24. Because four of the students failed to go, the cost of food for each student got increased by Rs1. How may students attended the picnic ?

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

25. The distance from A to B by two different routes are 75 km. A motors car taking the longer route travels on the average 6 km per hour faster than one taking the shorter route and does the journey in 15 minutes less. Find the speed of each car.

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

27. A Motor boat moving at 9 km/hr in still water goes 12 km downstream and comes back in total of 3 hours. Determine the speed of the water.

28. The length of a prayer room is 3 metres more than its width. If the area of the room is $36\ m^2$, calculate nearest to one-tenth of a metre, the length and width of the room.

29. Two pipes running together can fill a cistern in $11\frac{1}{9}$ minutes ; if on pipe takes 5 minutes more than the other to fill the cistern, find the time in which each pipe would fill the cistern.

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1. Is $(3x - 2)(2x - 3) = (2x + 5)(2x - 1)$ a quadratic equation ?

2. Is $3x(2x - 5) + 6 = 2x(3x + 5) - 6$ a quadratic equation ?

3. For the quadratic equation $3x^2 + 5x - 2 = 0$, show that :

   i. $x = \frac{1}{3}$ is a solution.

   ii. x = 3 is not a solution.

4. If $x = 1\frac{1}{2}$ is a solution of the equation $2x^2 + px - 6 = 0$, find the value of `p'.

5. If $\frac{2}{3}$ and $-\frac{1}{2}$ are solutions of quadratic equation $6x^2 + ax - b = 0$; find the values of a and b.

6. Without solving, examine the nature of the roots of the equation:

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

   ii. $x^2 + 6x + 9 = 0$

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

7. Find the value of `m', if the roots of the following quadratic equation are equal:

   $(4 + m)x^2 + (m + 1)x + 1 = 0$.

8. Solve :

   i. $2x^2 - 7x = 39$

   ii. $x^2 = 5x$

   iii. $x^2 = 16$.

9. Solve : $\frac{x}{x-1} + \frac{x-1}{x} = 2\frac{1}{2}$.

10. Find the quadratic equation whose solution set is $\{-2, 3\}$.

11. Use the substitution x = 3y + 1 to solve for y, if $5(3y + 1)^2 + 6(3y + 1) - 8 = 0$.

12. Without solving equation $x^2 - x + 1 = 0$; find whether x = -1 is a root of this equation or not.

13. Find the value of k for which x = 2 is a root (solution) of equation $kx^2 + 2x - 3 = 0$.

14. If x = 2 and x = 3 are roots of the equation $3x^2 - 2mx + 2n = 0$; find the values of m and n.

15. Find the value of `K' for which x = 3 is a solution of the quadratic equation, (K + 2)

    $x^2 - Kx + 6 = 0$

    Hence, find the other root of the equation.

16. Solve each of the following equations by using the formula :

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

    ii. $x^2 = 18x - 77$

    iii. $\sqrt{3}x^2 + 11x + 6\sqrt{3} = 0$.

17. Solve the following equation for x and give your answer correct to 2 decimal places :

$3x^2 + 5x - 9 = 0$.

18. Solve the following equation :

x $- \frac{18}{x} = 6$. Give your answer correct to two significant figures.

19. Solve :

    i. $2x^4 - 5x^2 + 3 = 0$

    ii. $(x^2 + 3x)^2 - (x^2 + 3x) - 6 = 0$, $x \in R$.

20. Solve : $\sqrt{\frac{x}{1-x}} + \sqrt{\frac{1-x}{x}} = 2\frac{1}{6}$, $x \neq 0$ and $x \neq 1$.

21. Find the solution set of the equation $3x^2 - 8x = 0$; when :

    i. $x \in Z$ (integers)

    ii. $x \in Q$ (rational numbers).

22. Solve : $(2x - 3)^2 = 25$.

23. Solve for x : $4\left(x - \frac{1}{x}\right)^2 + 8\left(x + \frac{1}{x}\right) = 29$. $x \neq 0$.

24. Solve : $\frac{a}{ax-1} + \frac{b}{bx-1} = a + b \neq 0$.