MATHEMATICS

Board –	Class –	Topic – Quadratic Equations

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.   **Ans:- 7/4**

2. A two digit number is four times the sum of the digits. It is also equal to 3 times the product of digits. Find the number.   **Ans:- 24**

3. Ansve for x: $\sqrt{3}x^2 – 2\sqrt{2}x - 2\sqrt{3} = 0$ **Ans:- $\sqrt{6}$**

4. For what value of k, is 3 a zero of the polynomial $2x^2 + x + k$?   **Ans:- -21**

5. Find the value of m so that the quadratic equation $mx(x – 7) + 49 = 0$ has two equal roots.

   Ans:- 4

6. If the roots of the quadratic equation $(a – b)x^2 + (b – c)x + (c – a) = 0$ are equal, prove that $2a = b + c$.

7. 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

   Ans:- 9,10,11

8. Two water taps together can fill a tank in 9 hours 36 minutes. The tap of larger diameter takes 8 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.   **Ans:- 16 and 24 hour**

9. Ansve the given quadratic equation for x: $9x^2 – 9(a + b)x + (2a^2 + 5ab + 2b^2) = 0$.

   Ans:- $\left(\frac{2a+b}{3}\right)$ & $\left(\frac{a+2b}{3}\right)$

10. Find that non-zero value of k, for which the quadratic equation $kx^2 + 1 – 2(k – 1)x + x^2 = 0$ has equal roots. Hence, find the roots of the equation.   **Ans:- 3**

11. If 2 is a root of the quadratic equation $3x^2 + px - 8 = 0$ and the quadratic equation $4x^2 - 2px + k = 0$ has equal roots, find the value of k. **Ans:- 1**

12. For what value of k, are the roots of the quadratic equation $(k + 4)x^2 + (k + l)x + 1 = 0$, equal? **Ans:- 5 or -3**

13. The time taken by a person to cover 150 km was 2. 1/2 hours more than the time taken in the return journey. If he returned at a speed of 10 km/hour more than the speed while going, find the speed per hour in each direction. **Ans:- 30 km/hr**

14. 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. **Ans:- length is 7 m and breadth is 4 m**

15. A pole has to be erected at a point on the boundary of a circular park of diameter 17 m in such a way that the differences of its distances from two diametrically opposite fixed gates where the pole is to be erected. **Ans:- 15 m**

16. The denominator of a fraction is one more than twice its numerator. If the sum of the fraction and its reciprocal 2. 16/21 find the fraction **Ans:- 3/7**

17. larger diameter is used for 4 hours and the pipe of smaller diameter for 9 hours, only half the pool can be filled. Find, how long it would take for each pipe to fill the pool separately, if the pipe of smaller diameter takes 10 hours more than the pipe of larger diameter to fill the pool. **Ans:- 20 hours , 30 hours**

18. A train travels at a certain average speed for a distance of 54 km and then travels a distance of 63 km at an average speed of 6 km/h more than the first speed. If it takes 3 hours to complete the total journey, what is its first speed? **Ans:- 36 km/hr**

19. The total cost of a certain length of a piece of cloth is rs 200. If the piece was 5 cm 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? **Ans:- Rs. 10/m**

20. In a flight of 2800 km, an aircraft was slowed down due to bad weather. Its average speed is reduced by 100 km/h and time increased by 30 minutes. Find the original duration of the flight.
Ans:- 3.5 hours

21. A two-digit number is such that the product of its digits is 14. When 45 is added to the number, the digits interchange their places. Find the number. **Ans:- 27**

22. A train travels 180 km at a uniform speed. If the speed had been 9 km/hour more, it would have taken 1 hour less for the same journey. Find the speed of the train.
Ans:- 36 km/hr

23. Find two consecutive natural numbers, the sum of whose squares is 145
Ans:- 8,9

24. Two water taps together can fill a tank in 6 hours. The tap of larger diameter takes 9 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.
Ans:- 18,9 hours

25. The difference of squares of two numbers is 88. If the larger number is 5 less than twice the smaller number, then find the two numbers. **Ans:- 9, 13**

26. Three consecutive positive integers are such that the sum of the square of the first and the product of the other two is 46. Find the integers. **Ans:- 4,5,6**

27. 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. **Ans:- 6, 12 years**