

BHARATIYA VIDYA BHAVAN'S V M PUBLIC SCHOOL, VADODARA  
QUESTION BANK

CHAPTER : QUADRATIC EQUATIONS

CLASS: X

- 1.
2. Find the roots of the following quadratic equations by factorization:
  - a.  $2x^2 - 5x + 3 = 0$
  - b.  $3x^2 - 2\sqrt{6}x + 2 = 0$
  - c.  $3x^2 - 14x - 5 = 0$
  - d.  $\sqrt{3}x^2 + 10x + 7\sqrt{3} = 0$
  - e.  $\sqrt{7}y^2 - 6y - 13\sqrt{7} = 0$
  - f.  $4x^2 - 4a^2x + a^4 - b^4 = 0$
  - g.  $a^2b^2x^2 + b^2x - a^2x - 1 = 0$
  - h.  $10ax^2 - 6x + 15ax - 9 = 0$
  - i.  $4x^2 - 2(a^2 + b^2)x + a^2b^2 = 0$
  - j.  $12abx^2 - (9a^2 - 8b^2)x - 6ab = 0$
  - k.  $x^2 - 24 + 10x = 0$ .
3. Find the roots of the following quadratic equations, if they exist by the method of completing the square:
  - a.  $5x^2 - 6x - 2 = 0$
  - b.  $2x^2 - 5x + 3 = 0$
  - c.  $9x^2 - 15x + 6 = 0$
  - d.  $x^2 - 9x + 18 = 0$
  - e.  $2x^2 + x + 4 = 0$
  - f.  $\sqrt{5}x^2 + 9x + 4\sqrt{5} = 0$
  - g.  $5x^2 - 24x - 5 = 0$
  - h.  $7x^2 - 13x - 2 = 0$
  - i.  $7x^2 + 2x - 5 = 0$
  - j.  $x^2 - 6x + 4 = 0$
  - k.  $15x^2 + 53x + 42 = 0$
4. Find the roots of the following quadratic equation by using the quadratic formula:
  - a.  $4x^2 + 3x + 5 = 0$
  - b.  $3x^2 + 2\sqrt{5}x - 5 = 0$
  - c.  $x^2 - 16x + 64 = 0$
  - d.  $3a^2x^2 + 8abx + 4b^2 = 0$
  - e.  $x - \frac{15}{4x} + 1 = 0$
  - f.  $9x^2 - 9(a+b)x + (2a^2 + 5ab + 2b^2) = 0$

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

3. Find the nature of roots for the equation (i)  $x^2+x+12 = 0$ (ii)  $6x^2 - x - 2 = 0$ . (iii)  $x^2-3x-10 = 0$

(iv)  $x^2-18x+45 = 0$ .

5. If  $x=2/3$  and  $x= (-3)$  are the roots of the equation  $ax^2 + 7x + b = 0$ , find the value of a & b.

6. A train travels 360 km at a uniform speed . If the speed had been 5 km/hr more, it would have taken 1 hour less for the same journey. Form the quadratic equation to find the speed of the train .

7. In each of the following , find the value of k for which the given value is a solution of the given equation:

a.  $7x^2 + kx - 3 = 0$  ,  $x= 2/3$

b.  $X^2 - x (a+b) + k = 0$ ,  $x = a$

8. 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 128. Form the quadratic equation to find how many marbles they had to start with, if John had x marbles. Solve this equation.

9. 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 articles 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. Solve this equation.

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 that of the passenger train, form the quadratic equation to find the average speed of express train. Solve this equation.

11. The difference of square of two numbers is 180 . the square of the smaller number is 8 times the large numbers find two numbers.

12. The speed of a boat in still water is 8 km/hr It can go 15 km upstream and 22 km downstream in 5 hours. Find the speed of the stream.

13. A fast train takes one hour less than a slow train for a journey of 200 km. If the speed of the slow train is 10 km/hr less than that of the fast train, find the speed of the two trains.

14. The time taken by a person to cover 150 km was 2.5 hrs more than the time taken in the return journey. If he returned at a speed of 10 km/hr more than the speed of going, what was the speed per hour in each direction?

15. A plane left 40 minutes late due to bad weather and in order to reach its destination, 1600 km away in time, it had to increase its speed by 400 km/hr from its usual speed. Find the usual speed of the plane.

16. A natural number, when increased by 12, equals to 160 times its reciprocal. Find the number.

17. A journey of 192 km from a town A to town B takes 2 hours more by an ordinary passenger train than a super fast train. If the speed of the faster is 16 km/h more, find the speeds of the faster and the passenger train.

18. Seven years ago, Varun's age was 5 times the square of Swati's age. 3 years hence, Swati's age will be  $\frac{2}{5}$ th of Varun's age. Find their present ages.

19. Solve the following equations.

(i)  $a^2b^2x^2 + (b^2 - a^2)x - 1 = 0$  (ii)  $12abx^2 - (9a^2 - 8b^2)x - 6ab = 0$ .

20. 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.

21. A person on tour has Rs. 4200 for his expenses. If he extends his tour for 3 days, he has to cut down his daily expenses by Rs 70. Find the original duration of the tour.

22. By increasing the list price of a book of Rs. 10 a person can buy 10 books less for Rs. 1200. Find the original list price of the book.

23. The angry Arjun carried some arrows for fighting with Bheeshm. With half the arrows, he cut down the arrows by Bheeshm on him and with six other arrows he killed the charioteer of Bheeshm. With one arrow each he knocked down respectively the rath, flag and bow of Bheeshm. Finally, with one more than four times the square root of arrows he laid Bheeshm unconscious on an arrow-bed. Find the total number of arrows Arjun had.

24. Out of a number of saras birds, one fourth the number are moving about in a lotus plants,  $\frac{1}{9}$ th coupled with  $\frac{1}{4}$ th as well as 7 times the square root of the number move on a hill; 56 birds remain in vakula trees. What is the total no of birds?

25. While boarding an aeroplane, a passenger got hurt, the pilot showing promptness and concern, made arrangement to hospitalize the injured and so the plane start late by 30 minutes, to reach the destination, 1500 km away in time, the pilot increased the speed by 100 km/hour. Find original speed per hour of the plane. Do you appreciate the value shown by the pilot, namely promptness, in providing help to the injured and his efforts to reach in time?

26. Seven years ago, Varun's age was 5 times the square of Swati's age. 3 years hence, Swati's age will be  $\frac{2}{5}$ th of Varun's age. Find their present ages.

27. In the centre of a rectangular plot with of land of Dimension 120m x 100m a rectangular portion is to be covered with tress so that the area of remaining part of plot is 10500m<sup>2</sup>. Find the dimension of the area to be planted.

28. One fourth of a classroom claim that they are creative, twice the square root of the group claim to be caring and the remaining 15 claim they are optimistic. Find total number of people in the classroom. (a) How many persons in the group are creative? (b) According to you which one of the above three values are more important.

29. If the price of petrol is increased by Rs 2 per litre a person will have to buy 1 litre less petrol for Rs 1740. Find the original price of the petrol at that time. (a) Why do you think the price of the petrol is increasing day-by-day? (b) Why should we save petrol?

30. Find the roots of  $ax^2 + bx + c = 0$ ,  $a \neq 0$  using the method of completing the square:

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