



# CBSE NCERT Based Chapter wise Questions (2025-2026)

Class-X

Subject: Mathematics

Total : 6 Marks (expected) [MCQ(1)-1 Mark, LA(1)-5 Marks]

Chapter Name : *Quadratic Equations* (Chap : 4)

**Level - 2** (Higher Order)

**MCQ Type :**

1. The quadratic equation whose one irrational root is  $3 + \sqrt{2}$  is

- (A)  $x^2 - 7x + 5 = 0$       (B)  $x^2 + 7x + 6 = 0$       (C)  $x^2 - 7x + 6 = 0$       (D)  $x^2 - 6x + 7 = 0$

[Hints : Irrational roots occur in conjugate pair.]

2. If the roots of  $ax^2 + bx + c = 0$  are in the ratio  $m : n$ , then

- (A)  $mna^2 = (m + n)c^2$       (B)  $mnb^2 = (m + n)ac$       (C)  $mnb^2 = (m + n)^2 ac$       (D)  $mnb^2 = (m - n)^2 ac$

[Hints : Use relations between roots and coefficients.]

3. If one root of the equation  $x^2 + px + 12 = 0$  is 4, while the equation  $x^2 + px + q = 0$  has equal roots, the value of  $q$  is

- (A)  $\frac{49}{4}$       (B)  $\frac{4}{49}$       (C) 4      (D) 49

[Hints : Find  $p$  and use condition for equal roots.]

4. If  $\alpha$  and  $\beta$  are the roots of the equation  $2x^2 - 3x - 6 = 0$ . The equation whose roots are  $\frac{1}{\alpha}$  and  $\frac{1}{\beta}$  is

- (A)  $6x^2 - 3x + 2 = 0$       (B)  $6x^2 + 3x - 2 = 0$       (C)  $6x^2 - 3x - 2 = 0$       (D)  $x^2 + 3x - 2 = 0$

[Hints : Interchange coefficients of  $x^2$  and constant term.]

5. If the roots of the equations  $ax^2 + 2bx + c = 0$  and  $bx^2 - 2\sqrt{ac}x + b = 0$  are simultaneously real, then

- (A)  $b = ac$       (B)  $b^2 = ac$       (C)  $a^2 = bc$       (D)  $c^2 = ab$

[Hints : Use condition for real roots.]

6. The sum of the squares of two consecutive natural numbers is 313. The numbers are

- (A) 12, 13      (B) 13, 14      (C) 11, 12      (D) 14, 15

[Hints :  $x^2 + (x + 1)^2 = 313$ .]

**LA Type Question:**

7. Solve for  $x$ :  $\frac{1}{x+1} + \frac{1}{2x-1} = \frac{11}{7x+9}$ ,  $x \neq -1, \frac{1}{2}, -\frac{9}{7}$ .

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

[Hints :  $\frac{192}{x} - \frac{192}{x+16} = 2$ .]

9. 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.

[Hints :  $\frac{1}{x} + \frac{1}{x-10} = \frac{8}{75}$ .]

10. The speed of a boat in still water is 11 km/hour. It can go 12 km upstream and return downstream to the original point in 2 hours 45 minutes. Find the speed of the stream.

[Hints :  $\frac{12}{11+x} + \frac{12}{11-x} = \frac{11}{4}$ .]

11. If roots of equation  $(c^2 - ab)x^2 - 2(a^2 - bc)x + b^2 - ac = 0$  are equal, then show that either  $a = 0$  or  $a^3 + b^3 + c^3 = 3abc$ .

[Hints : Use  $b^2 - 4ac = 0$ .]

12. A plane left 30 minutes later than the schedule time and in order to reach its destination 1500 km away in time, it has to increase its speed by 250 km/h from its usual speed. Find its usual speed.

[Hints :  $\frac{1500}{x} - \frac{1500}{250+x} = \frac{1}{2}$ .]

## ANSWER

1. Ⓐ
2. Ⓒ
3. Ⓐ
4. Ⓑ
5. Ⓑ
6. Ⓐ
7.  $8 \pm 5\sqrt{3}$
8. 32 km/h, 48 km/h
9. 25 hrs., 15 hrs.
10. 5 km/hr.
12. 750 km/hr.