



Chapter 4: Quadratic Equations

Important PYQs — Board 2023 & 2024

1 Mark – Multiple Choice

Q1. If the discriminant of the quadratic equation $3x^2 - 2x + c = 0$ is 16, then the value of c is [BOARD 2024]

- a) 1 b) 0 c) -1 d) $\sqrt{2}$

Q2. If the roots of the equation $ax^2 + bx + c = 0, a \neq 0$ are real and equal then which of the following relation is true? [BOARD 2024]

- a) $a = \frac{b^2}{c}$ b) $b^2 = ac$ c) $ac = \frac{b^2}{4}$ d) $c = \frac{b^2}{a}$

Q3. If the quadratic equation $ax^2 + bx + c = 0$ has two real and equal roots then c is [BOARD 2023 & BOARD 2024] ★ Repeated

- a) $\frac{-b}{2a}$ b) $\frac{b}{2a}$ c) $\frac{-b^2}{4a}$ d) $\frac{b^2}{4a}$

Q4. A quadratic equation whose roots are $2 + \sqrt{3}$ and $2 - \sqrt{3}$ is [BOARD 2023]

- a) $x^2 - 4x + 1 = 0$ b) $4x^2 - 3 = 0$ c) $x^2 + 4x + 1 = 0$ d) $x^2 - 1 = 0$

Q5. The least positive value of k for which the quadratic equation $2x^2 + kx - 4 = 0$ has rational roots, is [BOARD 2023]

- a) $\pm 2\sqrt{2}$ b) 2 c) ± 2 d) $\sqrt{2}$

Q6. If $x = 0.3$ is a root of the equation $x^2 - 0.9k = 0$ then k is [BOARD 2023]

- a) 1 b) 10 c) 0.1 d) 100

Q7. Find the value of k for which the equation $x^2 + k(2x + k - 1) + 2 = 0$ has real and equal roots. [BOARD 2023]

- a) 2 b) 3 c) 4 d) 5

Q8. If $\frac{1}{2}$ is a root of the equation $x^2 + kx - \frac{5}{4} = 0$, then the value of k is [BOARD 2024]

- a) 2 b) -2 c) $\frac{1}{4}$ d) $\frac{1}{2}$

Q9. The quadratic equation $5x^2 - 3x + 1 = 0$ has [BOARD 2024]

- a) Two distinct real roots b) No real roots c) two equal real roots d) more than 2 real roots

Q10. The ratio of the sum and product of the roots of the quadratic equation $5x^2 - 6x + 21 = 0$ is [BOARD 2024]

- a) 5:21 b) 2:7 c) 21:5 d) 7:2

Q11. Which of the following equations has the sum of its roots as 4? [BOARD 2023]



a) $2x^2 - 4x + 8 = 0$ b) $\sqrt{2}x^2 - \frac{4}{\sqrt{2}}x + 1 = 0$ c) $-x^2 + 4x + 4 = 0$ d) $4x^2 - 4x + 4 = 0$

Q12. The roots of the quadratic equation $x^2 - 0.04 = 0$ are **[BOARD 2023]**

- a) ± 0.2 b) ± 0.02 c) 0.4 d) 2

1 Mark – Assertion & Reasoning

Q1. Assertion (A): If $5 + \sqrt{7}$ is a root of a quadratic equation with rational co-efficient then its other root is $5 - \sqrt{7}$.

Reason (R): Surd roots of the quadratic equation with rational coefficient occur in conjugate pairs. **[BOARD 2023]**

- a) Both assertion(A) and reason(R) are true and reason(R) is the correct explanation of assertion(A)
- b) Both assertion(A) and reason(R) are true but reason(R) is not the correct explanation of assertion(A)
- c) Assertion (A) is true but reason (R) is false
- d) Assertion (A) is false but reason (R) is true

2 Marks

Q1. Find the sum and product of the roots of the quadratic equation $2x^2 - 9x + 4 = 0$. **[BOARD 2023]**

Q2. Find the discriminant of the quadratic equation $4x^2 - 5 = 0$ and hence comment on the nature of roots of the equation. **[BOARD 2023]**

Q3. A natural number when increased by 12 equals 160 times the reciprocal. Find the number. **[BOARD 2023]**

Q4. If one root of the quadratic equation $x^2 + 12x - k = 0$ is thrice the other root, then find the value of k. **[BOARD 2023]**

3 Marks

Q1. Three consecutive integers are such that sum of the square of second and product of other two is 161. Find the three integers. **[BOARD 2024]**

Q2. If α and β are roots of the quadratic equation $x^2 - 7x + 10 = 0$ find the quadratic equation whose roots are α^2 and β^2 . **[BOARD 2023]**

Q3. A dealer sells an article for Rs 75 and gains as much percent as the cost price of the article. Find the cost price of the article. **[BOARD 2024]**

Q4. Find the value of p for which the quadratic equation $px(x - 2) + 6 = 0$ has two equal real roots. **[BOARD 2023]**

Q5. In a 2-digit number, the digit at the unit's place is 5 less than the digit at the ten's place. The product of the digits is 36. Find the number. **[BOARD 2024]**

Q6. The sum of two numbers is 15. If the sum of their reciprocals is $\frac{3}{10}$ find the two numbers. **[BOARD 2023]**



5 Marks

Q1. Find the values of k for which the equation $(3k + 1)x^2 + 2(k + 1)x + 1$ has equal roots. Also find the roots. **[BOARD 2024]**

Q2. A train travels at a certain average speed for a distance of 54 km and then travels at a distance of 63 km at an average speed of 6 km/hr more than its original speed. If it takes 3 hours to complete total journey, what is the original average speed? **[BOARD 2023]**

Q3. The side of a square exceeds the side of another square by 4 cm and the sum of the areas of the two squares is 400 cm^2 . Find the sides of the squares. **[BOARD 2024]**

Q4. A two digit number is such that product of its digits is 14. If 45 is added to the number, the digits interchange their places. Find the number. **[BOARD 2024]**

Q5. In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/hr from its usual speed and the time of the flight increased by 30 minutes. Find the scheduled duration of the flight. **[BOARD 2024]**

Q6. Two water taps together can fill a tank in $\frac{15}{8}$ hours. The tap of larger diameter takes 2 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank. **[BOARD 2023]**

Q7. The age of a man is twice the square of the age of his son. Eight years hence, the age of the man will be 4 years more than three time the age of his son. Find their present ages. **[BOARD 2024]**

Q8. A train travels a distance of 90 km at a constant speed. Had the speed been 15 km/hr more, it would have taken 30 minutes less for the journey. Find the original speed of the train. **[BOARD 2024]**

Q9. 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. **[BOARD 2024]**

Q10. 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. **[BOARD 2024]**

Case Based Questions

Q1. A rectangular floor area can be completely tiled with 200 square tiles. If the side length of each tile is increased by 1 unit, it would take only 128 tiles to cover the floor. **[BOARD 2024]**

(i) Assuming the original length of each side of a tile be x units, makes a quadratic equation from the above information. **[1]**

(ii) Write the corresponding quadratic equation in standard form. **[1]**

(iii) Find the values of x , the length of side of a tile by factorization. **[2]**

OR Solve the quadratic equation for x , using quadratic formula. **[2]**



Q2. While designing the school year book, a teacher asked the student that the length and width of a particular photo is increased by x units each to double the area of the photo. The original photo is 18 cm long and 12 cm wide. **[BOARD 2023]**

Based on the above information, answer the following questions:

- (i) Write an algebraic equation depicting the above information. **[1]**
- (ii) Write the corresponding quadratic equation in standard form. **[1]**
- (iii) What should be the new dimensions of the enlarged photo? **[2]**

OR Can any rational value of x make the new area equal to 220cm^2 ? **[2]**

