MATHS WITHOUT GUESSWORK · BOARD BOOSTER

Quadratic Equations

LOCK THE SURE MARKS.
STRETCH FOR THE TOP.
PRACTISE THE BOARD WAY.

A board-exam practice companion for **CBSE Class 10 Mathematics**
Syllabus session 2026–27 · Standard (041)

🛡️ Secure Track | 🚀 Stretch Track | ~130 questions + 3 mini-mocks

Built around what the board actually tests

Factorise	Formula	Discriminant
split the middle term	$x = (-b \pm \sqrt{D}) / 2a$	$D = b^2-4ac \rightarrow$ the roots

Original questions and solutions. Answers kept separate. Not a substitute for the NCERT textbook or your teacher.

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Quadratic equations in the board paper

Know exactly how many marks are really at stake here — so you spend your effort where the paper pays.

◆ UNDERSTAND THE OFFICIAL NUMBER This chapter sits inside **Unit II — Algebra, worth 20 marks**, shared across four chapters — but it is one of the **heavyweights**. Expect it to earn you **5–7 marks**: a solve, a nature-of-roots question, and very often a full 5-mark word problem. CBSE publishes weightage per unit, not per chapter.

Where those marks usually fall (PYQ trend — based on past papers, not official)

Form it takes	Typical marks	What it tests
1–2 MCQ / Assertion-Reason	1–2	Discriminant, nature of roots, value of k for equal roots
A VSA or SA	2–3	Solve by factorisation / formula, or find k for a given nature
A case study or a 5-mark LA	4–5	A word problem — speed, area, ages, numbers — that forms a quadratic

⚠ COMMON TRAP STUDYING AN UN-REQUIRED METHOD In 2026–27 the prescribed solving methods are **factorisation** and the **quadratic formula** only. **"Completing the square" is no longer a required method** — don't spend practice time on it as a technique. Also, the chapter deals with **real roots only**: when D < 0, the answer is "no real roots," not a complex number.

Q7 The roots of $x^2 - 4x + 4 = 0$ are: A. 2, 2 B. 2, −2 C. 4, 1 D. −2, −2

1 GUIDED

Q8 The value of k for which $x^2 - 6x + k = 0$ has equal roots is: A. 6 B. 9 C. 3 D. 36

1 PART-GUIDED ★

Q9 If 2 is a root of $x^2 - 3x + k = 0$, then k = A. 1 B. 2 C. −2 D. 10

1 PART-GUIDED

Q10 The roots of $x^2 - 9 = 0$ are: A. 9, −9 B. 3, −3 C. 3, 3 D. 0, 9

1 GUIDED

Q11 The product of the roots of $2x^2 + 5x - 3 = 0$ is: A. 5/2 B. −3/2 C. 3/2 D. −5/2

1 PART-GUIDED

Q12 The sum of the roots of $x^2 - 7x + 10 = 0$ is: A. 7 B. −7 C. 10 D. 3

1 PART-GUIDED

Q13 A quadratic equation whose roots are 2 and 3 is: A. $x^2 - 5x + 6 = 0$ B. $x^2 + 5x + 6 = 0$ C. $x^2 - x - 6 = 0$ D. $x^2 - 6 = 0$

1 PART-GUIDED

Q14 For two distinct real roots, the discriminant must be: A. = 0 B. > 0 C. < 0 D. ≤ 0

1 GUIDED ★

Q15 The discriminant of $x^2 + 6x + 9 = 0$ is: A. 0 B. 36 C. 72 D. −36

1 GUIDED

Q16 A quadratic equation has at most how many roots? A. 1 B. 2 C. 3 D. infinite

1 GUIDED

Q17 If the roots of $x^2 - kx + 9 = 0$ are equal, then k = A. 3 only B. ±6 C. 9 D. ±3

1 INDEPENDENT ★

Q18 The positive root of $x^2 - x - 6 = 0$ is: A. 2 B. 3 C. −2 D. 6

1 GUIDED

Q19 The roots of $x^2 - 2x - 8 = 0$ are: A. 4, −2 B. −4, 2 C. 4, 2 D. 8, −1

1 GUIDED

Q20 A quadratic equation has no real roots when: A. D > 0 B. D = 0 C. D < 0 D. D ≥ 0

1 GUIDED ★

Q21 The value of k for which $kx^2 - 5x + k = 0$ has equal roots is: A. ±5/2 B. ±2/5 C. 5 D. ±5

1 UNFAMILIAR ★

Q22 The roots of $6x^2 - x - 2 = 0$ are: A. 2/3, −1/2 B. −2/3, 1/2 C. 3/2, −2 D. 1, −2

1 INDEPENDENT ★

Q23 If 1 is a root of $x^2 + ax + 3 = 0$, then a = A. 4 B. −4 C. 2 D. −2

1 PART-GUIDED

Q24 The equation $x^2 + 1 = 0$ has: A. two real roots B. one real root C. no real roots D. equal roots

1 GUIDED

Q25 The equation $(x - 2)^2 = 0$ has: A. distinct roots B. equal roots (2, 2) C. no real roots D. roots 2, −2

1 PART-GUIDED

Very Short Answer (2-mark) set

Twenty-two 2-mark questions — quick solves, discriminants, and nature of roots. State the answer clearly.

V1 Solve by factorisation: $x^2 - 7x + 12 = 0$.

2 GUIDED ★

V2 Solve by factorisation: $2x^2 - 5x - 3 = 0$.

2 PART-GUIDED ★

V3 Find the discriminant of $2x^2 - 4x + 3 = 0$ and state the nature of its roots.

2 PART-GUIDED ★

V4 Find the value of k for which $x^2 - 4x + k = 0$ has equal roots.

2 PART-GUIDED ★

V5 Is $x = 2$ a root of $x^2 + 2x - 8 = 0$? Justify.

2 GUIDED

V6 Solve: $x^2 - 3x = 0$.

2 GUIDED

V7 Write $3x(x - 2) = 5$ in standard form.

2 PART-GUIDED

V8 Find the roots of $4x^2 - 9 = 0$.

2 GUIDED

V9 Find the value of k for which $2x^2 + kx + 2 = 0$ has equal roots.

2 INDEPENDENT ★

Case studies (4-mark)

➤ CHOOSE THE METHOD EVERY CASE HIDES A QUADRATIC Each case gives a real situation, then sub-parts (1 + 1 + 2 marks). Name the unknown, form the quadratic, solve, and reject any impossible root (negative length, age or speed).

C1 **Rectangular garden.** A garden has an area of 60 m²; its length is 7 m more than its width.

- **(i)** Taking the width as x, write a quadratic equation. (1)
- **(ii)** Solve it. (1)
- **(iii)** State the length and width (reject the invalid value). (2)

4 PART-GUIDED ★

C2 **Thrown ball.** A ball is thrown upward; its height (in m) after t seconds is $h = -5t^2 + 20t$.

- **(i)** Is this a quadratic in t? (1)
- **(ii)** For what values of t is the ball at ground level (h = 0)? (1)
- **(iii)** Which value is the time it lands, and why is the other rejected? (2)

4 PART-GUIDED

Answer Key

Kept at the back on purpose — so a parent needn't teach. Model questions get full step-marked solutions; drills get the key steps, the answer, and the likely slip.

Section 6 — MCQ & Assertion-Reason

Q	Ans	Why
Q1	**A**	Degree 2 with $a \neq 0$; the others are linear or cubic.
Q2	**A**	Bring to one side: $x^2 - 3x + 2 = 0$.
Q3	**A**	$(x - 2)(x - 3) = 0 \Rightarrow 2, 3$.
Q4	**A**	$D = 9 - 8 = 1$.
Q5	**B**	$D = 0 \Rightarrow$ two equal real roots.
Q6	**C**	$D = 1 - 4 = -3 < 0 \Rightarrow$ no real roots.
Q7	**A**	$(x - 2)^2 = 0 \Rightarrow 2, 2$.
Q8	**B**	$D = 36 - 4k = 0 \Rightarrow k = 9$.
Q9	**B**	$4 - 6 + k = 0 \Rightarrow k = 2$.
Q10	**B**	$x^2 = 9 \Rightarrow x = \pm 3$.
Q11	**B**	Product $= c/a = -3/2$.
Q12	**A**	Sum $= -b/a = 7$.
Q13	**A**	$x^2 - (2+3)x + 6 = x^2 - 5x + 6$.
Q14	**B**	Distinct real $\Rightarrow D > 0$.
Q15	**A**	$D = 36 - 36 = 0$.

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