

PRINCIPAL SAAB
Periodic Assessment 1 (PA-1) — Answer Key
 Class X | Mathematics (041) | Periodic Assessment 1 | Session 2026-27

Time: 40 minutes | Maximum Marks: 25 | Answer Key

PA-1 is the very first periodic test of the session, and the 10 marks of internal assessment are built on it. This 25-mark practice paper covers Chapters 1, 2 and 3 of CBSE Class 10 Maths: Real Numbers, Polynomials, and Pair of Linear Equations in Two Variables. All the questions are original, and every answer has been solved step by step.

General Instructions

- Time: 40 minutes | Maximum Marks: 25
- Chapter coverage: Ch 1 Real Numbers (7 marks), Ch 2 Polynomials (9 marks), Ch 3 Pair of Linear Equations in Two Variables (9 marks).
- The paper has four sections — A (5 × 1 mark), B (4 × 2 marks), C (3 × 3 marks), D (1 case-study of 3 marks).
- All questions are compulsory. There is no internal choice.
- The use of a calculator is not allowed.
- Keep a separate page for rough work, and always write the working along with the final answer — in a PA you get marks for the steps as well.

Marking Scheme

Award marks only for a correct and complete answer to the part being marked. Where a question says "any two" or "any three", a student needs only that many correct points; the extra points below are given so that a range of correct answers can be marked fairly.

Section A

- Q1 — (A) pq^2 . For the HCF, the lowest power of every common prime is taken. $a = p^3q^2$, $b = p^1q^3$. The powers of p are 3 and 1 → the lower power is 1. The powers of q are 2 and 3 → the lower power is 2. Therefore $HCF = p^1q^2 = pq^2$.
- Q2 — (A) 9696. For two numbers, $HCF \times LCM = \text{first number} \times \text{second number}$. So $LCM = (96 \times 404) \div HCF = 38784 \div 4 = 9696$.
- Q3 — (B) 6. Since 2 is a zero, $p(2) = 0$. $(2)^2 - 5(2) + k = 0 \rightarrow 4 - 10 + k = 0 \rightarrow -6 + k = 0 \rightarrow k = 6$.
- Q4 — (C) two equal zeroes. The graph of a quadratic is a parabola. If it touches the x -axis at only one point, then the discriminant $b^2 - 4ac = 0$, which means the two zeroes are equal (coincident). For example: $x^2 - 6x + 9 = (x - 3)^2$, whose two zeroes are both 3.
- Q5 — (C) no solution. Here $a_1/a_2 = 2/4 = 1/2$ and $b_1/b_2 = 3/6 = 1/2$, but $c_1/c_2 = 7/5$. Since $a_1/a_2 = b_1/b_2 \neq c_1/c_2$, the lines are parallel — the system is inconsistent and has no solution.

Section B

- Q6. Prime factorisation: $90 = 2 \times 3^2 \times 5$ and $144 = 2^4 \times 3^2$. $HCF = \text{the lower powers of the common primes} = 2^1 \times 3^2 = 18$. $LCM = \text{the higher powers of all the primes} = 2^4 \times 3^2 \times 5 = 16 \times 9 \times 5 = 720$. Verification: $HCF \times LCM = 18 \times 720 = 12960$ and $90 \times 144 = 12960$. Both are equal — the answer is correct.
- Q7. Factorise $x^2 - 2x - 15$: two numbers are needed whose product is -15 and whose sum is $-2 \rightarrow -5$ and $+3$. So $x^2 - 5x + 3x - 15 = x(x - 5) + 3(x - 5) = (x - 5)(x + 3)$. Zeroes: 5 and -3 . Verification: here $a = 1$, $b = -2$, $c = -15$. Sum of zeroes $= 5 + (-3) = 2$ and $-b/a = -(-2)/1 = 2 \checkmark$. Product $= 5 \times (-3) = -15$ and $c/a = -15/1 = -15 \checkmark$.
- Q8. From the first equation, $x = 8 - 2y$. Substitute this into the second one: $2(8 - 2y) - y = 1 \rightarrow 16 - 4y - y = 1 \rightarrow 16 - 5y = 1 \rightarrow 5y = 15 \rightarrow y = 3$. Now $x = 8 - 2(3) = x = 2$. Check: $2 + 2(3) = 8 \checkmark$ and $2(2) - 3 = 1 \checkmark$.
- Q9. In $2x^2 - 7x + 3$, $a = 2$, $b = -7$, $c = 3$. So $\alpha + \beta = -b/a = 7/2$ and $\alpha\beta = c/a = 3/2$. $1/\alpha + 1/\beta = (\beta + \alpha)/(\alpha\beta) = (7/2) \div (3/2) = 7/2 \times 2/3 = 7/3$. Check: the zeroes are in fact 3 and $1/2$; $1/3 + 2 = 7/3 \checkmark$.

Section C

- Q10. Assume the opposite — that $5 - 2\sqrt{3}$ is rational. Then it can be written as equal to some rational number r : $5 - 2\sqrt{3} = r \Rightarrow 2\sqrt{3} = 5 - r \Rightarrow \sqrt{3} = (5 - r) \div 2$. Now 5 and r are both rational, and the difference of two rationals is rational; dividing that by 2 (a non-zero rational) also gives a rational. This means $\sqrt{3}$ turns out to be rational — but it is given that $\sqrt{3}$ is irrational. This is a contradiction. Therefore the initial assumption was wrong, and $5 - 2\sqrt{3}$ is irrational.
- Q11. Let the tens digit be x and the units digit be y . Number $= 10x + y$. Sum of the digits: $x + y = 11$... (i) On interchanging the digits the number becomes $10y + x$, which is 27 more: $10y + x = (10x + y) + 27 \rightarrow 9y - 9x = 27 \rightarrow y - x = 3$... (ii) (i) + (ii): $2y = 14 \rightarrow y = 7$; so $x = 11 - 7 = 4$. Original number $= 10(4) + 7 = 47$. Check: $4 + 7 = 11 \checkmark$ and $74 - 47 = 27 \checkmark$.
- Q12. Zeroes $\alpha = 3 + \sqrt{2}$, $\beta = 3 - \sqrt{2}$. Sum $= (3 + \sqrt{2}) + (3 - \sqrt{2}) = 6$. Product $= (3)^2 - (\sqrt{2})^2 = 9 - 2 = 7$. Polynomial $= x^2 - (\text{sum})x + (\text{product}) = x^2 - 6x + 7$. (Any non-zero multiple of this is also correct.) Sum of the squares of the zeroes: $\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta = (6)^2 - 2(7) = 36 - 14 = 22$.

Section D

Q13 (i). Riya: $3x + 4y = 240$. Mohit: $5x + 2y = 330$.

Q13 (ii). Multiply the second equation by 2: $10x + 4y = 660$. Now subtract the first equation: $(10x + 4y) - (3x + 4y) = 660 - 240 \rightarrow 7x = 420 \rightarrow x = 60$. $5(60) + 2y = 330 \rightarrow 300 + 2y = 330 \rightarrow y = 15$. One notebook costs ₹60 and one pen costs ₹15. Check: $3(60) + 4(15) = 180 + 60 = 240 \checkmark$.

Q13 (iii). 2 notebooks + 5 pens = $2(60) + 5(15) = 120 + 75 = ₹195$.

Apna Score Kaise Padhein

- 20-25: all three chapters are strong. Now move ahead to the PA-2 chapters.
- 14-19: the concepts are fine, but calculation slips are happening. Solve every wrong question again, without looking at the answer.
- Below 13: first read the notes of the chapter where you lost the most marks, then take this paper again after 3 days.

More chapter-wise tests and unit test papers are available here: [Unit Test & Practice Paper Hub](#).

Kaizen: the whole syllabus will not improve in one day. Today, solve again just that one question you got wrong — without looking at the answer. One small improvement every day, and by PA-1 the difference will be clearly visible.

□ Chapter notes for this paper: [Real Numbers](#) · [Polynomials](#) · [Pair of Linear Equations](#)