

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

This is an original PA 1 practice paper for CBSE Class 10 Mathematics (Standard), session 2026-27, built for schools whose first Periodic Assessment covers Chapters 1 to 4 — Real Numbers, Polynomials, Pair of Linear Equations in Two Variables and Quadratic Equations. It carries 25 marks and is designed to be finished in 40 minutes.

Before you start

- Maximum marks: 25
- Time allowed: 40 minutes
- Chapters covered: Chapter 1 (Real Numbers), Chapter 2 (Polynomials), Chapter 3 (Pair of Linear Equations in Two Variables), Chapter 4 (Quadratic Equations)
- Sections: A — 5 MCQs of 1 mark; B — 4 questions of 2 marks; C — 3 questions of 3 marks; D — 1 case-based question of 3 marks
- All questions are compulsory. Calculators are not allowed. Sit with a timer and write the full working, exactly as you would in the real assessment.

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 — (B) x^4y^3 . For the LCM of numbers written as products of primes, take the highest power of each prime that appears. Here $a = x^4y^2$ and $b = x^2y^3$. The highest power of x is 4 and the highest power of y is 3, so the LCM is x^4y^3 .

Q2 — (B) 12. If 3 is a zero, then $p(3) = 0$. So $(3)^2 - 7(3) + k = 0$, that is $9 - 21 + k = 0$, which gives $-12 + k = 0$ and therefore $k = 12$.

Q3 — (D) no solution. Compare the coefficients. $a_1/a_2 = 3/6 = 1/2$ and $b_1/b_2 = (-1)/(-2) = 1/2$, but $c_1/c_2 = 5/11$. Since $a_1/a_2 = b_1/b_2$ but this is not equal to c_1/c_2 , the two lines are parallel and the pair is inconsistent. There is no solution.

Q4 — (C) ± 12 . Equal roots means the discriminant is zero. $D = b^2 - 4ac = (-k)^2 - 4(4)(9) = k^2 - 144$. Setting $k^2 - 144 = 0$ gives $k^2 = 144$, so $k = 12$ or $k = -12$. Both values work, so the answer is ± 12 .

Q5 — (A) 72. For two numbers, $\text{HCF} \times \text{LCM} = \text{product of the numbers}$. So $9 \times 360 = 45 \times (\text{other number})$, giving $3240 = 45 \times (\text{other number})$, and the other number $= 3240 \div 45 = 72$. Check: $\text{HCF}(45, 72) = 9$ and $\text{LCM}(45, 72) = 360$, so the answer is consistent.

Section B

Q6 (2 marks). Suppose, on the contrary, that $5 + 2\sqrt{3}$ is rational. Then $5 + 2\sqrt{3} = p/q$ for some integers p and q with q not equal to 0. Rearranging, $2\sqrt{3} = p/q - 5 = (p - 5q)/q$, so $\sqrt{3} = (p - 5q)/(2q)$. The right-hand side is a ratio of two integers with a non-zero denominator, so it is a rational number. That would make $\sqrt{3}$ rational, which contradicts the given fact that $\sqrt{3}$ is irrational. Hence the assumption is wrong, and $5 + 2\sqrt{3}$ is irrational.

Q7 (2 marks). A quadratic polynomial with a given sum and product of zeroes is $x^2 - (\text{sum})x + (\text{product})$. Here the sum is -5 and the product is 6, so the polynomial is $x^2 - (-5)x + 6 = x^2 + 5x + 6$. Factorising, $x^2 + 5x + 6 = (x + 2)(x + 3)$, so the zeroes are $x = -2$ and $x = -3$. Check: $(-2) + (-3) = -5$ and $(-2)(-3) = 6$, as required.

Q8 (2 marks). The equations are $2x + 3y = 13$... (i) and $3x - y = 3$... (ii). Multiply equation (ii) by 3 so that the y terms match: $9x - 3y = 9$... (iii). Add (i) and (iii): $11x = 22$, so $x = 2$. Substitute $x = 2$ in (ii): $3(2) - y = 3$, so $6 - y = 3$ and $y = 3$. The solution is $x = 2, y = 3$. Check in (i): $2(2) + 3(3) = 4 + 9 = 13$. Correct.

Q9 (2 marks). Split the middle term of $2x^2 - 7x + 3$. Two numbers are needed whose product is $2 \times 3 = 6$ and whose sum is -7 ; these are -6 and -1 . So $2x^2 - 7x + 3 = 2x^2 - 6x - x + 3 = 2x(x - 3) - 1(x - 3) = (2x - 1)(x - 3)$. Setting each factor to zero gives $x = 1/2$ and $x = 3$. The roots are $1/2$ and 3.

Section C

Q10 (3 marks). The bells ring together again after a time equal to the LCM of 9, 12 and 15 minutes. Write each number as a product of primes: $9 = 3^2$, $12 = 2^2 \times 3$, and $15 = 3 \times 5$. Take the highest power of each prime: $\text{LCM} = 2^2 \times 3^2 \times 5 = 4 \times 9 \times 5 = 180$. So they ring together again after 180 minutes, which is 3 hours. Starting from 7:00 a.m., the next time all three ring together is 10:00 a.m.

Q11 (3 marks). For $p(x) = 2x^2 - 5x + 1$ we have $a = 2$, $b = -5$ and $c = 1$. (i) $\alpha + \beta = -b/a = 5/2$. (ii) $\alpha\beta = c/a = 1/2$. (iii) $1/\alpha + 1/\beta = (\beta + \alpha)/(\alpha\beta) = (5/2) \div (1/2) = 5$. So the three required values are $5/2$, $1/2$ and 5.

Q12 (3 marks). Let the father's present age be f years and the son's present age be s years. The first condition gives $f + s = 45$... (i). Five years ago their ages were $(f - 5)$ and $(s - 5)$, so the second condition gives $f - 5 = 6(s - 5)$, that is $f - 5 = 6s - 30$, so $f = 6s - 25$... (ii). Substituting (ii) into (i): $(6s - 25) + s = 45$, so $7s = 70$ and $s = 10$. Then $f = 45 - 10 = 35$. The father is 35 years old and the son is 10 years old. Check: five years ago they were 30 and 5, and $30 = 6 \times 5$. Correct.

Section D

Q13 (3 marks). (i) Let the breadth be x metres. Then the length is $(2x + 3)$ metres. Area = length $\times$ breadth, so $x(2x + 3) = 90$, which gives the quadratic equation $2x^2 + 3x - 90 = 0$. (ii) Here $a = 2$, $b = 3$ and $c = -90$. $D = b^2 - 4ac = 3^2 - 4(2)(-90) = 9 + 720 = 729$, and $\sqrt{729} = 27$. So $x = \frac{-b \pm \sqrt{D}}{2a} = \frac{-3 \pm 27}{4}$, which gives $x = \frac{24}{4} = 6$ or $x = \frac{-30}{4} = -7.5$. A breadth cannot be negative, so $x = 6$ is taken. Breadth = 6 m and length = $2(6) + 3 = 15$ m. Check: $6 \times 15 = 90$ square metres. Correct.

Marks distribution: Section A $5 \times 1 = 5$, Section B $4 \times 2 = 8$, Section C $3 \times 3 = 9$, Section D $1 \times 3 = 3$. Total = 25 marks.

Apna Score Kaise Padhein

- 21-25: Chapters 1 to 4 are solid. Move on to timed mixed practice.
- 16-20: Good base. Look at which chapter tag your lost marks came from and revise only that chapter.
- 11-15: The methods are known but the working is slipping. Redo Sections B and C without looking at the key.
- Below 11: Go back to the chapter notes first, then attempt this paper again after two days.

Looking for more assessment practice? The Unit Test and PA practice hub collects every chapter test and Periodic Assessment paper on the site, class by class.

Kaizen note: one paper attempted honestly under a timer teaches more than ten papers read with the answer key open. Improve by one mark at a time.