Mid April test (2026-27)

Marking Scheme Class X

Mathematics (Code – 041)

Section: A (Multiple Choice Questions- 1 Mark each)

1	**a.**	1: 2
2	**a.**	a
3	**c.**	$p(x) = x^2 - ax - b$ From Vieta's formulas: $\alpha + \beta = a$ $\alpha\beta = -b$ Now calculating: $\alpha + \beta + \alpha\beta = a + (-b) = a - b$
4	**c.**	3
5	**c.**	2
6	**a.**	Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

SECTION-B

(Question nos. 7 to 8 are very short Answer type questions carrying 2 marks each)

7.	$644 = 2^2 \times 7 \times 23$, $462 = 2 \times 3 \times 7 \times 11$, $LCM(644,462) = 2^2 \times 3 \times 7 \times 11 \times 23 = 21252$	½ ½ **1**
8.	No. $\sqrt{2}$ is irrational, and $(\sqrt{2})^2$ **1M for No** = 2 (rational), but π is irrational and π^2 is also irrational. 1/2 *MARKS FOR E.G AND* 1/2 *MARKS FOR VERIFICATION*	**1** ½ ½

SECTION-C

(Question nos. 9 to 10 are short Answer type questions carrying 3 marks each)

9.	$x^2 - x + 1 = 0$ $\alpha + \beta = 1,\ \alpha\beta = 1$ **New zeroes :** $\alpha - 3,\ \beta - 3$ **Sum of new zeroes** $(\alpha - 3) + (\beta - 3) = (\alpha + \beta) - 6 = 1 - 6 = -5$ **Product of new zeroes** $(\alpha - 3)(\beta - 3) = \alpha\beta - 3(\alpha + \beta) + 9 = 1 - 3(1) + 9 = 7$ **Required polynomial** $x^2 - (\text{sum})x + (\text{product}) = x^2 + 5x + 7$ $\boxed{x^2 + 5x + 7}$	**1** **½** **½** **1**
10.	**Step 1** : Orange juice used $= 138 - 6 = 132$ Apple juice used $= 186 - 6 = 180$ **Step 2: Maximum capacity of each cup (HCF)** $132 = 2^2 \times 3 \times 11$ $180 = 2^2 \times 3^2 \times 5$ $\text{HCF} = 2^2 \times 3 = 12$ **Step 3: Number of cups** $\text{Orange cups} = \frac{132}{12} = 11$ $\text{Apple cups} = \frac{180}{12} = 15$	**1** **1** **1**

SECTION-D

(Question nos. 11 is Long Answer type questions carrying 5 marks)

10.	**Step 1: Length of diagonal (Pythagoras theorem)** $d = \sqrt{2^2 + 1^2} = \sqrt{4 + 1} = \sqrt{5}$ **Step 2: Assume $\sqrt{5}$ is irrational** $\sqrt{5} = \frac{p}{q}$, where p, q are integers and have no common factor Squaring both sides $5 = \frac{p^2}{q^2}$ $p^2 = 5q^2$ **Step 3: Showing divisibility** p^2 is divisible by $5 \Rightarrow p$ is divisible by 5 Let $p = 5k$	**1** **1** **1**

	$(5k)^2 = 5q^2$ $25k^2 = 5q^2$ $q^2 = 5k^2 \Rightarrow q$ is also divisible by 5 **Step 4: Contradiction** Both p and q are divisible by 5, which contradicts that they have no common factor **Step 5 : Conclusion** $\therefore \sqrt{5}$ is irrational Hence, the diagonal cannot be written as $\frac{p}{q}$	**1** **1**

SECTION-E

(Question nos. 12 is a Case Based Answer type questions carrying 4 marks)

11.	$p(x) = x^2 - 7x + 12$ $p(x) = x^2 - 7x + 12 = (x-3)(x-4)$ Values of x for zero profit $(x-3)(x-4) = 0$ $x = 3,\ 4$ Profit is zero when 3 or 4 items are sold (no profit, no loss) Verification of relationships $\alpha + \beta = 3 + 4 = 7 = -\frac{-7}{1}$ $\alpha\beta = 3 \times 4 = 12 = \frac{12}{1}$ Zeros are 3 and 4, and relationships are verified	**1** **1** **1** **1**