# B K BIRLA CENTRE FOR EDUCATION

**SARALA BIRLA GROUP OF SCHOOLS**
**A CBSE DAY-CUM BOYS' RESIDENTIAL SCHOOL**
**MID APRIL TEST (2026-27)**

**MATHEMATICS (041)**

Class : X
Date : 15/04/26
Admission No.:

Duration :1Hrs.
Max.Marks:25
Roll No.:

---

**General Instructions:**

- This question paper consists of 5 sections: A, B, C, D, and E.
- Section A contains 6 questions of 1 mark each. All questions are compulsory.
- Section B contains very short questions of 2 marks each.
- Section C contains short answer questions of 3 marks each.
- Section D contains long answer question of 5 marks.
- Section E contains a case-study-based question OF 4 marks
- Use of calculator is not permitted.
- Draw neat diagrams wherever required.
- Show all necessary steps for full marks.
- Read all questions carefully before attempting.

---

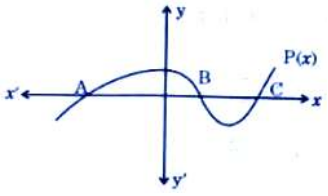
## SECTION – {A}
**(This section comprises of Multiple-choice questions (MCQ) of 1 mark each )**

**1.** The ratio of HCF to LCM of the least composite numbers and least prime number is
   a. 1: 2
   b. 2 : 1
   c. 1: 1
   d. 1 : 3

**2.** For any prime number $p$ , if $p$ divides $a^2$ , where $a$ is any real number then $p$ also divides
   a. a
   b. $a^{\frac{3}{2}}$
   c. $a^{\frac{1}{2}}$
   d. $a^{\frac{1}{8}}$

**3.** If $\alpha$ and $\beta$ are the zeroes of the polynomial $p(x) = x^2 - ax - b$ , then the value of $(\alpha + \beta + \alpha\beta)$ is equal to
   a. $a + b$
   b. $-a - b$
   c. $a - b$
   d. $-a + b$

**4.** In fig. The graph of a polynomial $p(x)$ is shown . The number of zeros of $p(x)$ is
   a. 1
   b. 2
   c. 3
   d. 4




**5.** How many zero(es) does the polynomial $293x^2 - 293x$
   a. 0 b. 1 c. 2 d. 3

**Questions number 6** are Assertion and Reason based question. Two statements are given, one labelled as Assertion $(A)$ and the other is labelled as Reason $(R)$. Select the correct answer to these questions from the codes $(A), (B), (C)\ and\ (D)$ as given below.

a. Both Assertion $(A)$ and Reason $(R)$ are true and Reason $(R)$ is the correct explanation of the Assertion $(A)$.

b. Both Assertion $(A)$ and Reason (R) are true, but Reason $(R)$ is not the correct explanation of the Assertion (A).

c. Assertion $(A)$ is true, but Reason $(R)$ is false.

d. Assertion $(A)$ is false, but Reason $(R)$ is true.

**6.**

**Assertion (A) :** The number $5^n$ cannot end with the digit 0 , where $n$ is a natural number .

**Reason (R) :** Prime factorization of 5 has only two factors 1 and 5 .

**SECTION – {B}**

**(This section comprises of very short answer type questions (VSA) of 2 mark each)**

**7.** Find the smallest number which is divisible by both 644 and 462.

**8.** Is the square of irrational number always rational. Give answer by showing your work.

**SECTION – {C}**

**(This section comprises of short answer type questions (SA) of 3 marks each)**

**9.** If $\alpha$ and $\beta$ are the zeroes of the polynomial $x^2 - x + 1$ . Obtain a polynomial whose zeroes are $\alpha - 3$ and $\beta - 3$ .

**10.** For a school event, a teacher has:138 ml of orange juice , 186 ml of apple juice . She wants to pour both juices into identical small cups such that . After pouring , 6 ml of orange juice is left and 6 ml of apple juice is left . Each cup must be completely filled.

i. What is the maximum capacity of each cup?

ii. How many cups are filled from each juice?

**SECTION – {D}**

**(This section comprises of long answer-type questions (LA) of 5 marks each)**

**11.**

i. A rectangular garden has length 2 units and breadth 1 unit. Find the length of the diagonal of the garden using the Pythagoras theorem.

ii. A student claims that this diagonal can be written exactly as a fraction $\frac{p}{q}$, where $p$ , $q$ are integers having no common factor.

Assume the student is correct and write $\sqrt{5} = \frac{p}{q}$

Show that both $p$ and $q$ must be divisible by 5.

iii. Explain why this leads to a contradiction.

iv. What can you conclude about the length of the diagonal?

## SECTION – {E}

**(This section comprises of case-study/passage-based question of 4 marks)**

**12.** A company models its profit (in thousands of rupees) using the polynomial:

$$p(x) = x^2 - 7x + 12$$

where $x$ is the number of items sold.

Answer the following:

i. Factorise $p(x)$

ii. Find the values of $x$ for which profit is zero and interpret their meaning in this context

iii. Without using the factorised form, verify the relationship between zeros and coefficients:

- Sum of zeros $= -\frac{b}{a}$
- Product of zeros $= \frac{c}{a}$