CLASS XI – MATHEMATICS (041)
CHAPTER 4 : COMPLEX NUMBERS AND QUADRATIC EQUATIONS
PRACTICE PAPER (SESSION 2026–27)

Maximum Marks: 40 **Time Allowed: 1½ Hours**

General Instructions:

Read the following instructions very carefully and strictly follow them:

1. This question paper contains 23 questions. All questions are compulsory.
2. This question paper is divided into five Sections – A, B, C, D and E.
3. In Section A, Questions 1 to 12 are Multiple Choice Questions (MCQs) and Questions 13 and 14 are Assertion–Reason based questions of 1 mark each.
4. In Section B, Questions 15 to 18 are Very Short Answer (VSA) type questions, carrying 2 marks each.
5. In Section C, Questions 19 to 21 are Short Answer (SA) type questions, carrying 3 marks each.
6. In Section D, Question 22 is a Long Answer (LA) type question, carrying 5 marks.
7. In Section E, Question 23 is a case study based question, carrying 4 marks.
8. There is no overall choice. However, an internal choice has been provided in 2 questions of Section B (Q17, Q18), 2 questions of Section C (Q20, Q21), in Q22 of Section D and in one sub-part of Q23 of Section E.
9. Draw neat and clean figures wherever required. Use of calculators is not allowed. Throughout this paper, $i = \sqrt{-1}$.

SECTION – A **(14 × 1 = 14)**

This section comprises of 12 multiple choice questions (Q1–Q12) and 2 assertion–reason based questions (Q13–Q14) of 1 mark each.

No.	Questions	Marks
Q1.	In the Argand plane of Fig. 1, the point P represents the complex number z. The conjugate of z is	**1**

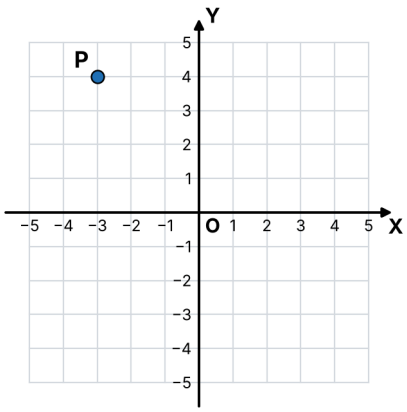


Fig. 1

(A) 3 + 4i (B) −3 − 4i

(C) 3 − 4i (D) 4 − 3i

Q2. The point P in Fig. 2 represents the complex number z. The value of |z| is **1**

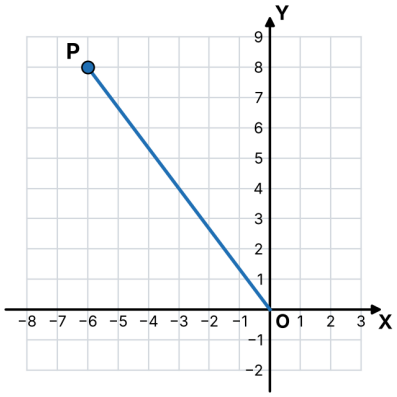


Fig. 2

(A) 14 (B) 2

(C) 10 (D) 100

Q3. The value of $i^{43} + i^{-21}$ is **1**

(A) 2i (B) −2

(C) 0 (D) −2i

Q4. If z = (2 − i)(3 + 4i), then Re z + Im z is equal to **1**

(A) 15 (B) 10

(C) 5 (D) 50

Q5. If (x + 2y) + i(3x − y) = 4 + 5i, where x and y are real numbers, then $x^2 + y^2$ is equal to **1**

(A) 3 (B) 5

(C) 4 (D) 1

Q6. The multiplicative inverse of the complex number 5 − 12i is **1**

(A) (5 − 12i)/169 (B) (5 + 12i)/13

(C) (5 + 12i)/169 (D) (−5 + 12i)/169

Q7. The modulus of the complex number (2 + i)(1 − 2i) is **1**

(A) √5 (B) 25

(C) 10 (D) 5

Q8. Fig. 3 shows four points P, Q, R and S in the Argand plane. The point that represents the complex number $i(2 + 3i)$ is **1**

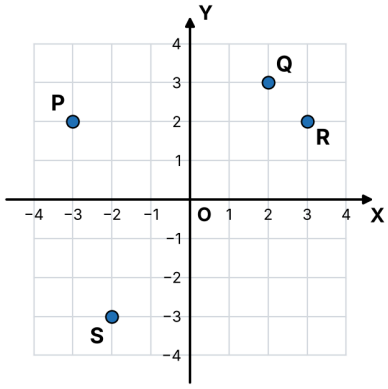


Fig. 3

(A) P (B) Q

(C) R (D) S

Q9. The value of $\sqrt{-4} \times \sqrt{-9}$ (taking $\sqrt{-a} = i\sqrt{a}$ for $a > 0$) is **1**

(A) 6 (B) -6

(C) $6i$ (D) $-6i$

Q10. The conjugate of the complex number $(1 + i)^2 / (2 - i)$ is **1**

(A) $(-2 + 4i)/5$ (B) $(2 - 4i)/5$

(C) $(-2 - 4i)/5$ (D) $(2 + 4i)/5$

Q11. $(1 + i)^6$ is equal to **1**

(A) $-8i$ (B) $8i$

(C) 8 (D) -8

Q12. The imaginary part of $(3 + 2i)/(1 - i)$ is **1**

(A) 1/2 (B) 5

(C) $-5/2$ (D) 5/2

Assertion–Reason Based Questions

Directions: Question numbers 13 and 14 are Assertion and Reason based questions carrying 1 mark each. Two statements are given, one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer from the options (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 Assertion (A).

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

(C) Assertion (A) is true but Reason (R) is false.

(D) Assertion (A) is false but Reason (R) is true.

Q13. **Assertion (A):** The square roots of -9 are $3i$ and $-3i$. **1**

Reason (R): $\sqrt{a} \times \sqrt{b} = \sqrt{(ab)}$ for all real numbers a and b.

Q14. **Assertion (A):** The multiplicative inverse of the complex number $3 - 4i$ is $3 + 4i$. **1**

Reason (R): The multiplicative inverse of a non-zero complex number z is $\bar{z} / |z|^2$.

SECTION – B (4 × 2 = 8)

This section comprises of 4 very short answer (VSA) type questions of 2 marks each.

Q15. In Fig. 4, the points A and B in the Argand plane represent the complex numbers z_1 and z_2 respectively. **2**

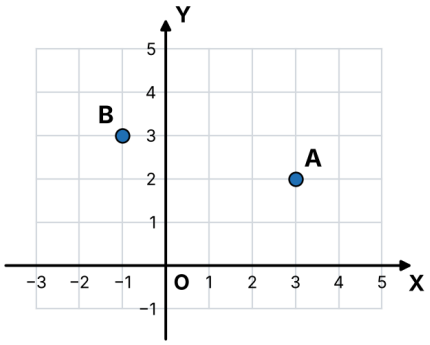


Fig. 4

(i) Write z_1 and z_2 in the form a + ib. **[1]**
(ii) Find the product z_1z_2. **[1]**

Q16. Evaluate $i^{37} + 1/i^{67}$. **2**

Q17. **(A)** Express $(2 + 3i)/(4 - i)$ in the form a + ib. **2**

OR

(B) Find the multiplicative inverse of $2 - 5i$.

Q18. **(A)** Find the modulus and the conjugate of the complex number $(1 + 2i)/(1 - 3i)$. **2**

OR

(B) Find the real numbers x and y if $(1 + i)x + (2 - i)y = 5 + 2i$.

SECTION – C (3 × 3 = 9)

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

Q19. In Fig. 5, the point P represents a complex number z in the Argand plane and the point Q is the mirror image of P in the real axis. **3**

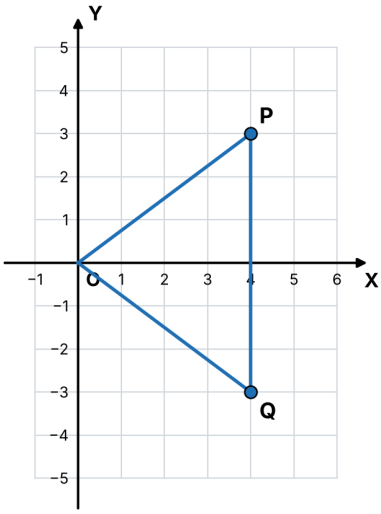


Fig. 5

(i) Write the complex numbers z and $\bar{z}$ represented by P and Q. **[1]**
(ii) Find $|z|$ and $|\bar{z}|$. **[1]**
(iii) Find $z\,\bar{z}$ and show that $z\,\bar{z} = |z|^2$. **[1]**

Q20. **(A)** Express $(2 + i)/(3 - i) + (2 - i)/(3 + i)$ in the form $a + ib$. **3**

OR

(B) Express $(1 + i)^3 / (2 - i)$ in the form $a + ib$.

Q21. **(A)** For $z_1 = 1 + 2i$ and $z_2 = 3 - i$, verify that $|z_1 z_2| = |z_1||z_2|$ and $|z_1/z_2| = |z_1|/|z_2|$. **3**

OR

(B) If $z = (3 + i)(1 - 2i)/(2 + i)$, find $\bar{z}$ and $|z|$.

SECTION – D (1 × 5 = 5)

This section comprises of 1 long answer (LA) type question of 5 marks.

Q22. **(A)** Let $z = (3 + 4i)/(2 - i)$. **5**

(i) Express z in the form $a + ib$. **[2]**

(ii) Find $\bar{z}$ and $|z|$. **[1]**

(iii) Find the multiplicative inverse of z. **[1]**

(iv) Verify that $z\,\bar{z} = |z|^2$. **[1]**

OR

(B) (i) If $(x + iy)(1 - 2i) = 5 + 5i$, where x and y are real numbers, find x and y. **[3]**

(ii) Hence find the conjugate and the modulus of $x + iy$. **[2]**

SECTION – E (1 × 4 = 4)

This section comprises of 1 case study based question of 4 marks with sub-parts (i), (ii), (iii) of marks 1, 1, 2 respectively.

Q23. **Case Study:** A town map is drawn on the Argand plane with the metro station at the origin O; each side of a grid square represents 1 km. The stadium S, the mall M and the park P are shown in Fig. 6, and each place is represented by a complex number. The mall M is the mirror image of the stadium S in the real axis. **4**

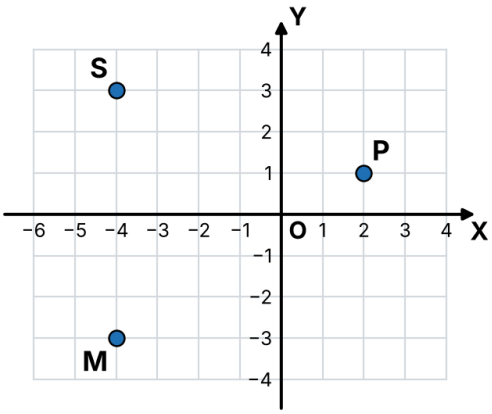


Fig. 6

Based on the given information, answer the following questions:

(i) Write the complex numbers z_S and z_M represented by S and M. **[1]**

(ii) Find the distance of the stadium from the metro station. **[1]**

(iii) **(a)** A café C is located at the point representing the multiplicative inverse of z_S. Find the complex number representing C in the form $a + ib$. **[2]**

OR

(b) If the park P represents z_P, find z_S/z_P in the form $a + ib$. **[2]**

— End of Question Paper —