Class- X
Pre Mid Term Examination, 2025-26
Subject- Mathematics (041)
Set : B2

Time Allowed: 2 Hours **Maximum Marks: 50**

General Instructions:

1. This question paper contains 23 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Question no. 1-9 are multiple choice questions (MCQs) and question no. 10 is Assertion- Reason based question of 1 mark each.
4. In Section B, Question no. 11-15 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Question no. 16-19 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Question no. 20-21 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Question no. 22-23 are case study based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 1 Question of Section B, 1 Question of Section C and 1 Question of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat figures wherever required.
10. Use of calculators is NOT allowed.

SECTION A

Section A consists of 10 questions of 1 mark each.

1 In the adjoining figure, PQ || XY || BC, AP = 2 cm, PX = 1.5 cm and BX = 4 cm.

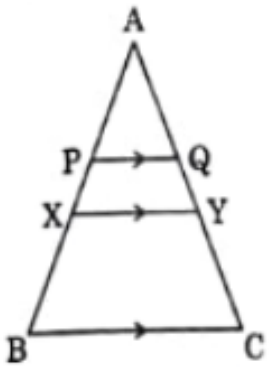
If QY = 0.75 cm, then AQ + CY =

(A) 6 cm

(B) 3 cm

(C) 4.5 cm

(D) 5.25 cm



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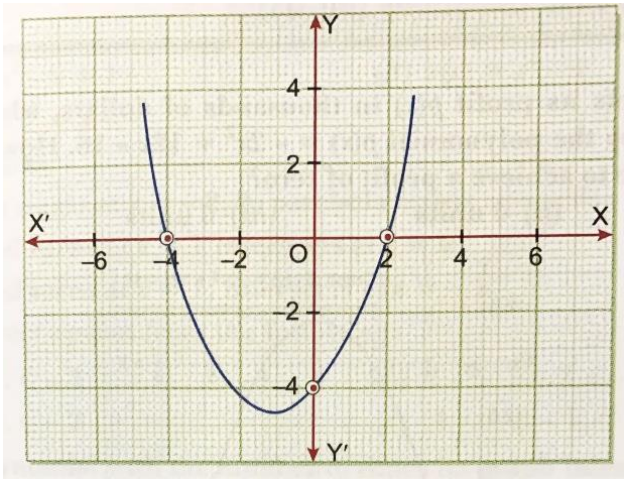
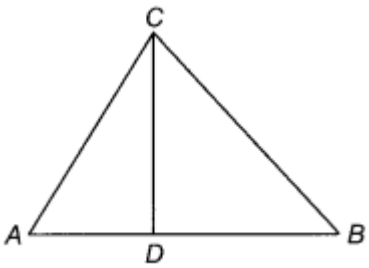
2	Shown below is a graph of a quadratic polynomial.  Which of these is the polynomial graphed above? (A) $(x-2)(x+4)$ (B) $(x+2)(x-4)$ (C) $\frac{1}{2}(x-2)(x+4)$ (D) $\frac{1}{2}(x+2)(x-4)$	**1**
3	The system of equations $2x+1=0$ and $3y-5=0$ has (A) unique solution (C) no solution (B) two solutions (D) infinite number of solutions	**1**
4	Which of the following quadratic equations has real and equal roots? (A) $(x+1)^2=2x+1$ (B) $x^2+x=0$ (C) $x^2-4=0$ (D) $x^2+x+1=0$	**1**
5	A quadratic equation whose roots are $(2+\sqrt{3})$ and $(2-\sqrt{3})$ is : (A) $x^2+4x+1=0$ (B) $x^2-4x+1=0$ (C) $4x^2-3=0$ (D) $x^2-1=0$	**1**
6	Two coins are tossed simultaneously. The probability of getting at least one head is (A) $\frac{3}{4}$ (B) $\frac{1}{4}$ (C) $\frac{1}{2}$ (D) 1	**1**
7	A pair of irrational numbers whose product is a rational number is : (A) $(\sqrt{16},\sqrt{4})$ (B) $(\sqrt{5},\sqrt{2})$ (C) $(\sqrt{3},\sqrt{27})$ (D) $(\sqrt{36},\sqrt{2})$	**1**

8	In ΔABC and ΔDEF, $\frac{AB}{DE} = \frac{BC}{FD}$. Which of the following makes the two triangles similar? (A) ∠A = ∠D (B) ∠B = ∠D (C) ∠B = ∠E (D) ∠A = ∠F	**1**
9	Which of the following cannot be the unit digit of 8^n, where n is a natural number? (A) 4 (B) 2 (C) 0 (D) 6	**1**
10	**Statement A (Assertion): In an experiment of throwing a die, Event E_1: getting a number less than 3 and Event E_2: getting a number greater than 3 are complementary events.** **Statement R (Reason): If two events E and Fare complementary events, then P(E) + P(F) = 1.** (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 and 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.	**1**
	SECTION B **Section B consists of 5 questions of 2 marks each.**	
11	Prove that $3 + 5\sqrt{2}$ is irrational, given that $\sqrt{2}$ is irrational.	**2**
12	If $217x + 131y = 913$ and $131x + 217y = 827$, solve the equations for the values of x and y.	**2**
13	Find the zeroes of the quadratic polynomial $x^2 - 15$ and verify the relationship between the zeroes and the coefficients.	**2**
14	(a) Represent the following situations in the form of quadratic equation: The sides of a right triangle are such that the longest side is 4 m more than the shortest side and the third side is 2 m less than the longest side. **OR**	**2**

	(b) Find the value of 'p' for which the quadratic equation $px(x - 2) + 6 = 0$ has two equal real roots.	
15	Two dice are thrown at the same time and the numbers appearing on top are noted. Find the probability of (i) Getting a number greater than 3 on each die (ii) the sum of the numbers is greater than 9.	**2**
	SECTION C **Section C consists of 4 questions of 3 marks each.**	
16	Three measuring rods are of lengths 120 cm, 100 cm and 150 cm. Find the least length of a fence that can be measured an exact number of times, using any of the rods. How many times each rod will be used to measure the length of the fence?	**3**
17	For what values of k will the following pair of linear equations have infinitely many solutions? $kx + 3y - (k - 3) = 0$ $12x + ky - k = 0$	**3**
18	(a) In the given figure, if ∠ACB = ∠CDA, AC = 8 cm and AD = 3 cm, find BD.  **OR** (b) If the sides AB, BC and median AD of ΔABC are proportional to the corresponding sides PQ, QR and median PM of ΔPQR, show that $\Delta ABC \sim \Delta PQR$.	**3**
19	If α and β are zeroes of the polynomial $3x^2 - 7x - 6$ then form a quadratic polynomial whose zeroes are $\alpha - 3$ and $\beta - 3$.	**3**

SECTION D

Section D consists of 2 questions of 5 marks each.

20 State and prove Basic Proportionality Theorem. **5**

21 (a) Solve graphically the pair of linear equations: **5**

$2x + y = 8$; $x + 1 = 2y$.

Also, determine the coordinates of the vertices of the triangle formed by these lines and the x-axis.

OR

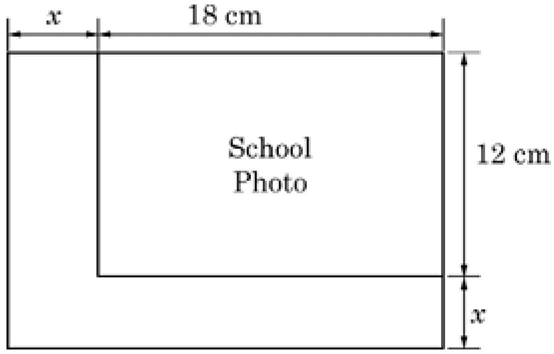
(b) Places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of the two cars?

SECTION E

Case study based questions are compulsory.

22 **Case Study 1**

While designing the school year book, a teacher asked the student that the length and width of a particular photo is increased by x units each to double the area of the photo. The original photo is 18 cm long and 12 cm wide.



Based on the above information, answer the following questions:

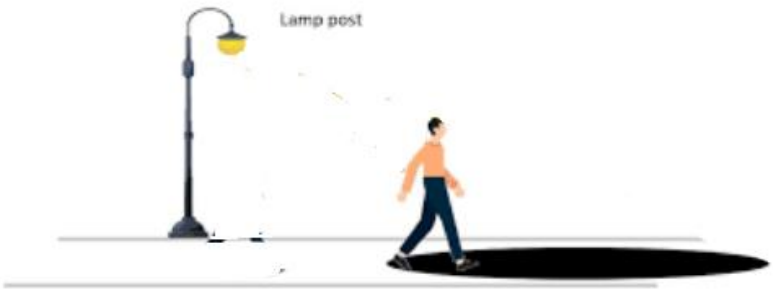
(i) Write an algebraic equation depicting the above information. **1**

(ii) Write the corresponding quadratic equation in standard form. **1**

(iii) (a) What should be the new dimensions of the enlarged photo? **2**

OR

(iii) (b) Can any rational value of x make the new area equal to 220 cm^2?

23	**Case Study 2** After dinner, some people were walking in the park. A person observed the length of shadow of a boy 180 cm tall walking away from the base of a lamp-post 5.4 m high, at a speed of 0.6 m/s.  Based on the above information answers the following questions: (i) How far is he from the lamp-post after 3 seconds? (ii) Draw a well labelled figure for the given information. (iii) (a) Find the length of his shadow after 3 seconds. **OR** (iii) (b) After how much time the length of his shadow will be 1.5 m?	**1** **1** **2**