U CAN ACADEMY & TUITION CENTER – THERADI – THIRUVOTTIYUR(91760-25144)

MATHEMATICS

CLASS - X (2026-27) – UNIT TEST #1

PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

QUADRATIC EQUATIONS

PROBABILITY

Maximum Marks: 45 **Time: 2 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 no. 1 to 10 are multiple choice questions (MCQs) with only one correct option and Questions no. 11 and 12 are Assertion-Reason based questions of 1 mark each.
4. In Section B, Questions no. 13 to 15 are Very Short Answer (VSA)-type questions, carrying 2 marks each.
5. In Section C, Questions no. 16 to 18 are Short Answer (SA)-type questions, carrying 3 marks each.
6. In Section D, Questions no. 19 and 20 are Long Answer (LA)-type questions, carrying 5 marks each.
7. In Section E, Questions no. 21 to 23 are Case study-based questions, carrying 4 marks each(Any two case study you can attend).
8. Use of calculator is not allowed.

SECTION-A

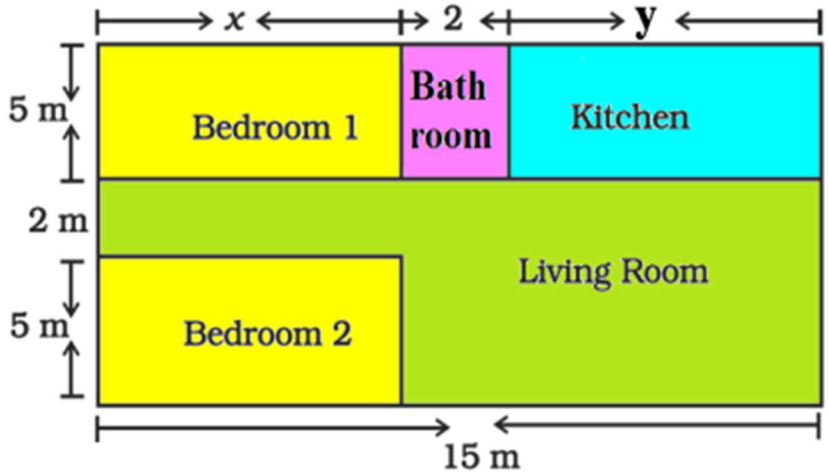
This section comprises of multiple choice questions (MCQs) of 1 mark each.

Select the correct option (Question 1 - Question 12)

Q.No.	Questions	Marks
1.	The pair of linear equations $2x + 3y = 5$ and $4x + 6y = 10$ is (a) inconsistent (b) consistent (c) dependent consistent (d) none of these	1
2.	If $x = a$, $y = b$ is the solution of the pair of equations $x – y = 2$ and $x + y = 4$, then the respective values of a and b are (a) 3, 5 (b) 5, 3 (c) 3, 1 (d) –1, –3	1
3.	The pair of equations $ax + 2y = 7$ and $3x + by = 16$ represent parallel lines if (a) $a = b$ (b) $3a = 2b$ (c) $2a = 3b$ (d) $ab = 6$	1
4.	The graph of a quadratic equation is a (a) straight line (b) parabola (c) circle (d) ellipse	1
5.	A bag has 5 white marbles, 8 red marbles and 4 purple marbles. If we take a marble randomly, then what is the probability of not getting purple marble? (a) 0.5 (b) 0.66 (c) 0.08 (d) 0.77	1

6.	Which of the following are the roots of the quadratic equation $x^2 - 9x + 20 = 0$? (a) 3, 4 (b) 4, 5 (c) 5, 6 (d) 6, 7	1
7.	In the elimination method, one variable is removed by (a) adding (b) subtracting (c) multiplying (d) both (a) and (b)	1
8.	A box contains cards numbered 9 to 53. A card is drawn at random from the box. The probability that the drawn card has a number which is a perfect square is : (a) 1/45 (b) 2/15 (c) 4/45 (d) 1/9	1
9.	The graphical representation of a linear equation in two variables is a (a) curve (b) line (c) parabola (d) circle	1
10.	The equation $(x + 1)^2 = 2(x - 3)$is (a) Linear (b) Quadratic (c) Cubic (d) None	1
	ASSERTION-REASON BASED QUESTIONS **(Question numbers 11 and 12 are Assertion-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 (A) and (R) are true and (R) is the correct explanation of (A). (B) Both (A) and (R) are true but (R) is not the correct explanation of (A). (C) (A) is true but (R) is false. (D) (A) is false but (R) is true.	
11.	**Assertion (A):** The probability of winning a game is 0.4, then the probability of losing it, is 0.6. **Reason (R):** P(E) + P (not E) = 1	1
12.	**Assertion (A):** If $b^2 - 4ac < 0$, the equation has no real roots. **Reason (R):** Negative discriminant means the square root is not a real number.	1
	SECTION B **This section comprises of 3 very short answer (VSA) type questions of 2 marks each.**	
13A.	Solve for x and y: 2x + 3y = 7; 4x + 3y = 11 ***OR*** Find the discriminant of $3x^2 - 2x + \frac{1}{3} = 0$and hence determine the nature of its roots.	2
13B.		
14.	Find the value of $k$such that the quadratic equation $k - 12)x^2 + 2(k - 12)x + 2 = 0$has equal roots.	2
15A.	The ratio of incomes of two persons is 9 : 7 and the ratio of their expenditures is 4 : 3. If each of them manages to save ` 2000 per month, find their monthly incomes. ***OR*** One card is drawn at random from a well-shuffled deck of 52 playing cards. Find the probability that the card drawn is (i) either a red card or a king, (ii) neither a red card nor a queen.	2
15B.		
	SECTION C **This section comprises of 3 short answer (SA) type questions of 3 marks each.**	
16A.	Draw the graphs of the equations x – y + 1 = 0 and 3x + 2y – 12 = 0. Determine the coordinates of the vertices of the triangle formed by these lines and the x-axis, and shade the triangular region.	3

16B.	***OR*** Two coins are tossed simultaneously. What is the probability of getting (i) At least one head? (ii) At most one tail? (iii) A head and a tail?	
17.	Aftab tells his daughter, "Seven years ago, I was seven times as old as you were then. Also, three years from now, I shall be three times as old as you will be." Represent this situation algebraically and find their present ages.	3
18A.	A train travels 480 km at a uniform speed. If the speed had been 8 km/h less, it would have taken 3 hours more. Find the speed of the train. ***OR***	3
18B.	The sum of the digits of a two digit number is 9. The number obtained by reversing the order of digits of the given number exceeds the given number by 27. Find the given number.	
SECTION D **This section comprises of 2 long answer (LA) type questions of 5 marks each**		
19A.	From a pack of 52 playing cards, jacks, queens, kings and aces of red colour are removed. From the remaining a card is drawn at random. Find the probability that the card drawn is (i) a black queen (ii) a red card (iii) a face card (iv) a spade card ***OR***	5
19B.	John and Jivanti together have 45 marbles. Both of them lost 5 marbles each, and the product of the number of marbles they now have is 124. We would like to find out how many marbles they had to start with.	
20A.	A box contains cards bearing numbers from 6 to 70. If one card is drawn at random from the box, find the probability that it bears (i) a one digit number. (ii) a number divisible by 5. (iii) an odd number less than 30. (iv) a composite number between 50 and 70. ***OR***	5
20B.	Five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. How old are Nuri and Sonu?	
SECTION- E **This section comprises of any 2 case-study/passage-based questions of 4 marks each with subparts. The first two case study questions have three subparts (I), (II), (III) of marks 1, 1, 2 respectively. The third case study question has four subparts of 1 marks each**		
21.	**Case Study -1** Tushara took a pack of 52 cards. She kept aside all the black face cards and shuffled the remaining cards well. Based on the above information answer the following questions. (i) Write the number of total possible outcomes. (ii) She draws a card from the well-shuffled pack of remaining cards. What is the probability that the card is a face card? (iii) Write the probability of drawing a black card. OR (iii) What is the probability of getting neither a black card nor an ace card?	4
22.	**Case Study -2**	4

	Raj and Ajay are very close friends. Both the families decide to go to Ranikhet by their own cars. Raj's car travels at a speed of x km/h while Ajay's car travels 5 km/h faster than Raj's car. Raj took 4 hours more than Ajay to complete he journey of 400 km (a) What will be the distance covered by Ajay's car in two hours? (1) (b) Which of the following quadratic equation describe the speed of Raj's car? (2) (c) What is the speed of Raj's car? (1)	
23.	**Case Study -3** Amit is planning to buy a house and the layout is given below. The design and the measurement has been made such that areas of two bedrooms and kitchen together is 95 sq.m.  Based on the above information, answer the following questions: (a) Form the pair of linear equations in two variables from this situation. (b) Find the length of the outer boundary of the layout. (c) Find the area of each bedroom and kitchen in the layout. (d) Find the area of living room in the layout.	4