THE VILLAGE
INTERNATIONAL SCHOOL
"We Nurture Dreams"

AIM HIGH, TOGETHER WE FLY

Date:07/06/24 GRADE: X	MT - 01 (2024-25) MATHEMATICS ANSWER KEY	Max marks: 20 Time: 50 Minutes

General Instructions:
1 All questions are compulsory.
2. Marks are indicated against each question.

Qn. No	QUESTIONS 1 TO 5 CARRY ONE MARK EACH	Marks allocated
1	What is the greatest possible speed at which a man can walk 52 km and 91 km in an exact number of hours? (a) 17 km/hr (b) 7 km/hr **(c) 13 km/hr** (d) 26 km/hr	1
2	If -4 is a zero of the polynomial $x^2 - x - (2k+2)$ then the other zero is (a) 3 (b) 4 **(c) 5** (d) 7	1
3	For what value of k, do the equations $3x - y + 8 = 0$ and $6x - ky = -16$ represent coincident lines? (a) $\frac{1}{2}$ (b) $\frac{-1}{2}$ **(c) 2** (d) -2	1
4	A box contains 25 cards numbered from 1 to 25. A card is drawn at random from the bag. The probability that the number on the drawn card is divisible by 2 and 3 is (a) $\frac{1}{5}$ (b) $\frac{3}{25}$ **(c) $\frac{4}{25}$** (d) $\frac{2}{25}$	1
5	If a die is thrown once, the probability of getting a composite number on the die will be (a) $\frac{1}{2}$ (b) $\frac{2}{3}$ **(c) $\frac{1}{3}$** (d) 0	1

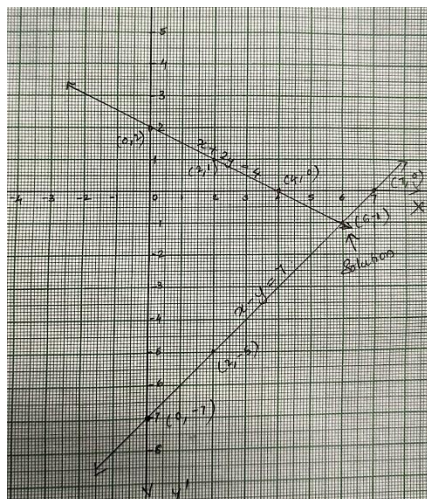|	**QUESTIONS 6 AND 7 CARRY TWO MARKS EACH**	
6	If α and β are the zeroes of the polynomial $x^2 - 5x + 6$ then find the value of $\alpha^2 + \beta^2$ Sum of zeroes = α + β = 5 Product of zeroes = αβ = 6 $(\alpha+\beta)^2 = \alpha^2+\beta^2+2\alpha\beta$ $\alpha^2+\beta^2 = (\alpha+\beta)^2 - 2\alpha\beta$ = 25 – 12 = 13	2
7	Given that √2 is irrational, prove that $(5 + 3\sqrt{2})$ is an irrational number. Given that √2 is irrational number. Let √2 =m Suppose, 5+3√2 is a rational number. So, 5+3√2 =ab (a≠b, b≠0) 3√2 =ab−5 3√2 =a−5bb or √2 =a−5b3b So, a−5b3b=m But a−5b3b is rational number, so m is rational number which contradicts the fact that m = √2 is irrational number. So, our supposition is wrong. Hence, 5+3√2 is also irrational.	2
	QUESTIONS 8 AND 9 CARRY THREE MARKS EACH	
8	Solve the following system of equation graphically. Also find the points where the lines represented by the given equations intersect the X – axis. x + 2y = 4 	x	0	4	2	 |---|---|---|---| 	y	2	0	1	 	(x,y)	(0,2)	(4,0)	(2,1)	 x – y = 7 	x	0	7	2	 |---|---|---|---| 	y	-7	0	-5	 	(x,y)	(0, -7)	(7,0)	(2,-5)	 	3 Point of intersection of the two lines on X axis are (4, 0) and (7, 0)

| 9 | From a pack of 52 playing cards, Jacks, Queens, and Kings of red color are removed. From the remaining, a card is drawn at random. Find the probability that the card drawn is:

(i) a black king,

(ii) a card of red color,

(iii) a card of black color

Total no of outcomes = 52

After removing red Jacks , Queens and kings , the total no of outcomes is 52 – 6 = 46

    (i)   Let E be the event of taking a black king

    P(E) = 2/46 = 1/13

    (ii)   Total red card = 26 - 6 = 20

    Probability of drawing red colour card= 20/46 = 10/23

    (iii)   Total card of black colour = 26

    Probability of drawing black colour card= 26/46 = 13/23. | 3 |

10	**CASE STUDY**	
	Due to heavy storm, an electric wire got bent as shown in the figure. It followed a mathematical shape. Answer the following questions below:	
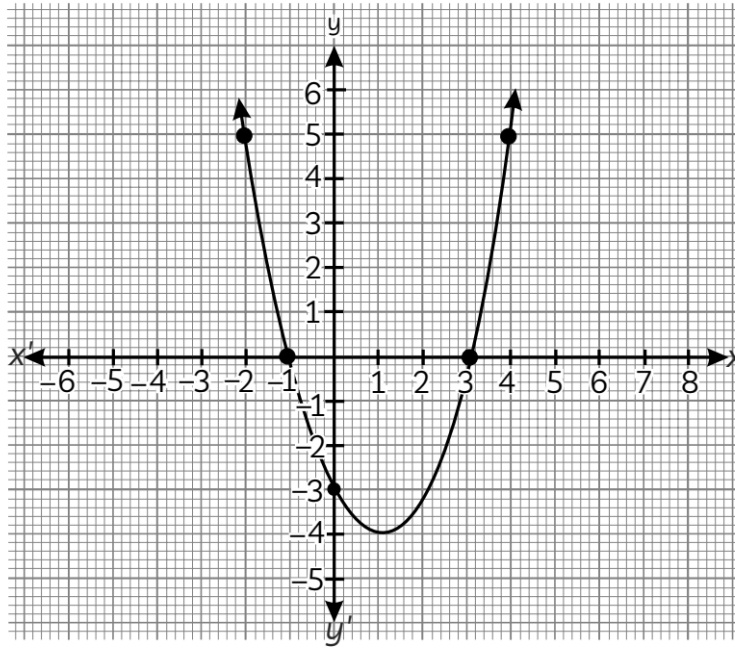
(A) ✎ Name the shape in which the wire is bent.

    (a) Spiral   (b) Ellipse

    (c) Linear   ⭐ Parabola

(B) How many zeroes are there for the polynomial (shape of the wire)?

    ⭐ 2   (b) 3

    (d) 1   (d) 0

(C) The zeroes of the polynomial are:

    (a) –1, 5   ⭐ –1, 3

    (c) 3, 5   (d) –4, 2

(D) What will be the expression of the polynomial?

    (a) $x^2 + 2x - 3$ (b) $x^2 - 2x + 3$

    ⭐ $x^2 - 2x - 3$ (d) $x^2 + 2x + 3$

(E) ✎ What is the value of the polynomial if $x = -1$?

    (a) 6   (b) – 18

    (c) 18   ⭐ 0