THE VILLAGE
INTERNATIONAL SCHOOL
"We Nurture Dreams"

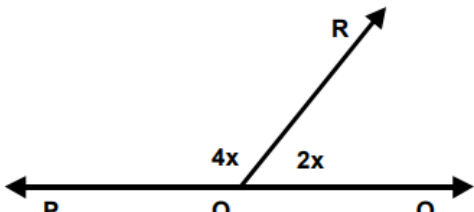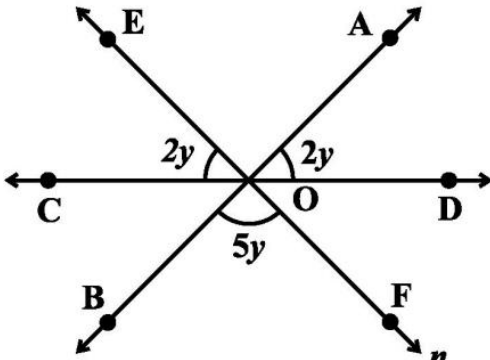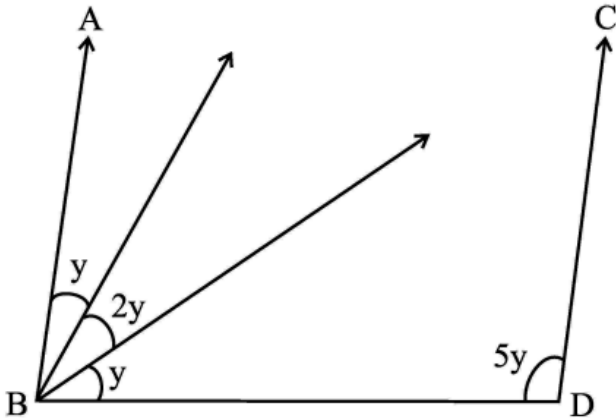| DATE: 30/09/2024	FIRST TERMINAL EXAMINATION (2024 - 25)	TIME: 3 Hrs
GRADE: IX	MATHEMATICS (041)	MAX MARKS: 80

GENERAL INSTRUCTIONS:

1. THIS QUESTION PAPER HAS 5 SECTIONS A, B, C, D, E
2. SECTION A HAS 20 MCQS CARRYING 1 MARK EACH
3. SECTION B HAS 5 QUSTIONS CARRYING 2 MARKS EACH
4. SECTION C HAS 6 QUESTIONS CARRYING 3 MARKS EACH
5. SECTION D HAS 4 QUESTIONS CARRYING 5 MARKS EACH
6. SECTION E HAS 3 CASE BASED INTERGRATED UNITS OF ASSESSMENT (4 MARKS EACH) WITH SUBPARTS OF THE VALUES OF 1, 1 AND 2 MARKS EACH RESPECTIVELY.
7. ALL QUESTIONS ARE COMPULSORY. HOWEVER, AN INTERNAL CHOICE IN 2 QUESTIONS OF 5 MARKS, 2 QUESTIONS OF 3 MARKS AND 2 QUESTIONS OF 2 MARKS HAS BEEN PROVIDED.

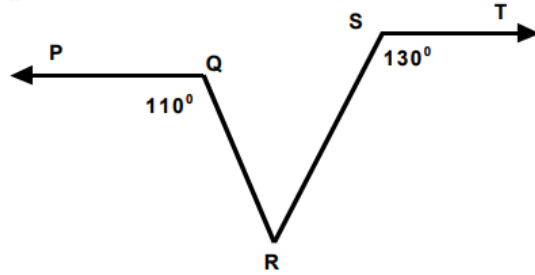| SL. NO.	SECTION A	MARKS
	SECTION A CONSISTS OF 20 QUESTIONS OF 1 MARK EACH	
1.	The value of $11^{1/2} \div 11^{1/4}$ is: a. $11^{1/4}$ b. $11^{3/4}$ c. $11^{1/8}$ d. $11^{1/2}$	1
2.	On dividing $x^3 + 3x^2 + 3x + 1$ by x we get remainder: a. -1 b. 0 c. 1 d. 2	1
3.	Without actual calculating the cubes the value of $28^3 + (-15)^3 + (-13)^3$ is: a. – 16380 b. 16380 c. 15380 d. - 15380	1

4.	The point (0,4) lies on
	  a. I quadrant b. negative x – axis
	  c. positive x – axis d. y - axis
		1

5.	How many linear equations in x and y can be satisfied by x = 1 and y = 2? a. Only one b. two c. infinitely many d. three	1
6.	The angle which is four times its complement is: a. 60^0 b. 30^0 c. 45^0 d. 72^0	1
7.	Two adjacent angles on a straight line are in the ratio 5 : 4, then the measure of each one of these angles are	1

	a. 100^0 and 80^0 b. 75^0 and 105^0 c. 90^0 and 90^0 d. 60^0 and 120^0	
8.	The sum of all angles around a point is a. 100^0 b. 180^0 c. 90^0 d. 360^0	1
9.	In fig. POQ is a line, $\angle POR = 4x$ and $\angle QOR = 2x$ then the value of x is (a) 50^0 (b) 20^0 c) 30^0 (d) 90^0	1
10.	The zero of $p(x) = 2x - 7$ is: (a) $\dfrac{7}{2}$ (b) $\dfrac{2}{7}$ (c) $\dfrac{-2}{7}$ (d) $\dfrac{-7}{2}$	1
11.	If $\left(\dfrac{3}{4}\right)^6 \times \left(\dfrac{16}{9}\right)^5 = \left(\dfrac{4}{3}\right)^{x+2}$, then the value of x is (a) 2 (b) 4 (c) -2 (d) 6	1
12.	If we add two irrational numbers, the resulting number (a) is always an irrational number (b) is always a rational number (c) may be a rational or an irrational number (d) always an integer	1
13.	Which of the following is a term of a polynomial? (a) $2x$ (b) $\dfrac{3}{x}$ (c) $x^{\sqrt{x}}$ (d) $\sqrt{x}$	1
14.	The graph of the linear equation $2x + 3y = 6$ is a line which meets the x axis at the point (a) (2, 0) (b) (0, 3) (c) (3, 0) (d) (0, 2)	1
15.	The degree of the polynomial $p(x) = (4x^2 + x)(3 - x^4)$ is: a. 4 b. 1 c. 6 d. 5	1

16.	Factorization of $x^3 + 1$ is:
	    a. $(x - 1)(x^2 - x +1)$ b. $(x + 1)(x^2 + x +1)$
	    c. $(x + 1)(x^2 - x -1)$ d. $(x + 1)(x^2 - x +1)$
		1

17.	The perpendicular distance of the point $P(3,4)$ from the y – axis is: (a) 3 (b) 4 (c) 5 (d) 7	1

18.	If a wheel has six spokes equally spaced, then the measure of the angle between two adjacent spokes is (a) 90^0 (b) 30^0 c) 60^0 (d) 180^0	1

19.	Assertion(A): The graph of every linear equation in two variables is a straight line.
	
	Reason(R): x = 0 is the equation of the y-axis and y = 0 is the equation of the x-axis.
	
	    a. Both A and R are true and R is the correct explanation of A
	    b. Both A and R are true and R is not the correct explanation of A
	    c. A is true but R is false
	    d. A is false but R is true
		1

20.	Assertion(A): Decimal expansion of every rational number is only terminating.
	
	Reason(R): Decimal expansion of every irrational number is terminating recurring
	
	    a. Both A and R are true and R is the correct explanation of A
	    b. Both A and R are true and R is not the correct explanation of A
	    c. A is true but R is false
	    d. Both A and R is false
		1

	SECTION B	
	SECTION B CONSISTS OF 5 QUESTIONS OF 2 MARKS EACH	
21.	Find the measure of an angle, if seven times its complement is 10° less than three times its supplement. Or In the below Figure, AB, CD and EF are three lines concurrent at O. Find the value of y. 	2

22.	Five years ago Arjun's age was three times Shriya's age. If age of Arjun is x years and age of Shriya is y years, represent the above statement as a linear equation in two variables in the standard form and mention the values of a, b and c.	2
23.	Show that $\dfrac{1}{3-\sqrt{8}} - \dfrac{1}{\sqrt{8}-\sqrt{7}} + \dfrac{1}{\sqrt{7}-\sqrt{6}} - \dfrac{1}{\sqrt{6}-\sqrt{5}} + \dfrac{1}{\sqrt{5}-2} = 5$ OR Prove that $\dfrac{a^{-1}}{a^{-1}+b^{-1}} + \dfrac{a^{-1}}{a^{-1}-b^{-1}} = \dfrac{2b^2}{b^2-a^2}$	2
24.	If $p(y) = y^3 - 3y^2 + 4y - 6$, then evaluate $p(3) - p(-1) + p(0)$	2
25.	Write the decimal expansion of $4\frac{1}{8}$ and state what type of decimal it is.	2
	SECTION C	
	SECTION C CONSISTS OF 6 QUESTONS OF 3 MARKS EACH	
26.	Factorise: (a) $6x^2 + 7x - 3$ (b) $1 + 8y^3$	3
27.	Simplify with positive exponent: (a) $(27)^{\frac{-1}{3}} \times (32)^{\frac{2}{5}}$ (b) $(16)^{\frac{-1}{4}} + (25)^{\frac{-1}{2}}$ OR Simplify by rationalising the denominator: $\dfrac{6-4\sqrt{2}}{6+4\sqrt{2}}$	3
28.	If $(x + 1)$ is a factor of $ax^3 + x^2 - 2x + 4a - 9$, find the value of a.	3
29.	Three vertices of a rectangle are (4, 2), (-3, 2) and (-3, 7). Plot these points and find the coordinates of the fourth vertex. Also find the area of the rectangle so formed.	3
30.	a. In the figure, if AB ‖ CD, then what is the value of y. b. Express 0.666666…….in the p/q form	3

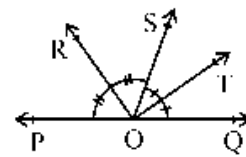In fig, if PQ || ST, ∠PQR = 110⁰ and ∠RST = 130⁰ then find the value of ∠QRS.

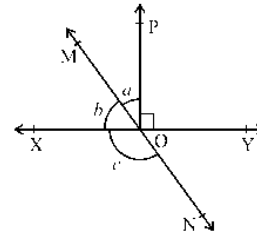| 31. | If x = 3k + 2 and y = 2k − 1 is a solution of the equation 4x − 3y + 1 = 0, find k.
Also find two solutions for the equation. | 2

1 |

SECTION D
SECTION D CONSISTS OF 4 QUESTIONS OF 5 MARKS EACH

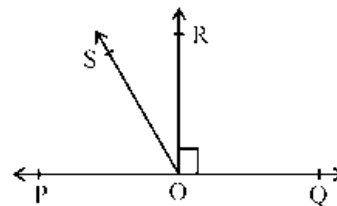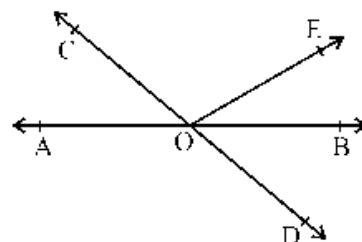| 32. | a. In the given figure, ray OS stands on a line POQ. Ray OR and ray OT are angle bisectors of ∠ POS and ∠ SOQ, respectively. If ∠ POS = x, find ∠ ROT.

b. In Fig. lines XY and MN intersect at O. If ∠ POY = 90° and a : b = 2 : 3, find c. | 5 |

Or

a. In Fig. POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that ∠ ROS = $\frac{1}{2}$ (∠ QOS − ∠ POS)

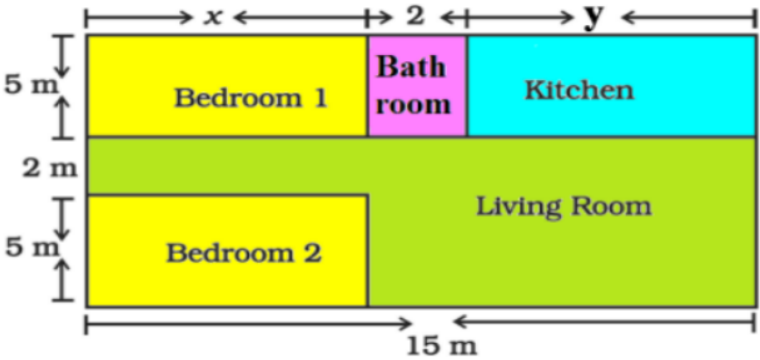b. In Fig. lines AB and CD intersect at O. If ∠ AOC + ∠ BOE = 70° and ∠ BOD = 40°, find ∠ BOE and reflex ∠ COE.
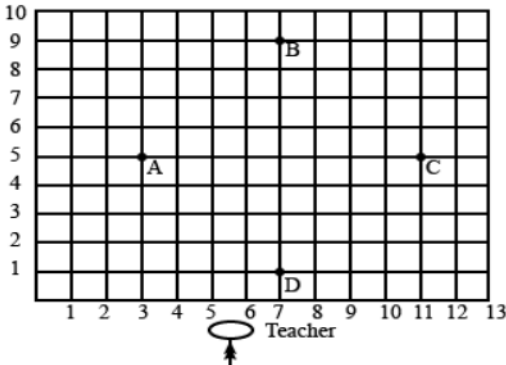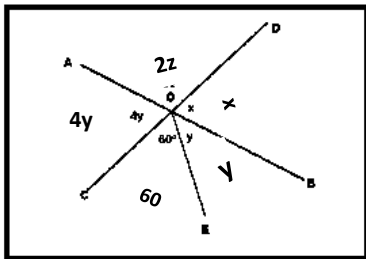
33.	Form linear equations in two variables for the following situations. a. The taxi fare in a city is such that Rs 50 is fixed amount and Rs 16 per km is charged. Taking the distance covered as x km and total fare as Rs y, write a linear equation in x and y. Also, find the fare if the taxi covers 120km. b. If present age of son and father are expressed by x and y respectively and after 10 years father will be twice as old as his son. Write the relation between x and y. Also find fathers age when son is 20 years old.	5
34.	a. Find the value of k, if (x - 1) is a factor of p(x) = $2x^2 + kx + \sqrt{2}$ b. Factorise: $x^3 + 13x^2 + 32x + 20$	2 3
35.	a. Construct $\sqrt{3.5}$ on a number line. b. If x = 2 + √3, find the value of $x + \frac{1}{x}$ Or a. Construct √2 on a number line. b. If a and b are rational numbers and $\frac{2+\sqrt{3}}{2-\sqrt{3}}$ = a + b√3, find the values of a and b	2.5 2.5 2.5 2.5

	SECTION E	
	CASE BASED QUESTIONS	

36.	Case Study: Apartments have increasingly become the most supplied property type across cities in India. Their popularity can be attributed to reasons including but not limited to contemporary looks, modern day amenities, in-house maintenance and better security. Inaya is planning to buy a 2BHK apartment and the layout is given below. The design and the measurement has been made such that area of bedrooms and kitchen together is 95 sq.m. 	

	a. Which pair of linear equations in two variables does describe this situation. (a) $x + y = 17, 3x + y = 15$ (b) $x + y = 27, 3x + 4y = 95$ (c) $5x + 2y = 15, x + 4y = 12$ (d) $2x + y = 19, x + y = 13$	1
	b. What is the length of the outer boundary of the layout? (a) 40m (b) 54m (c) 27m (d) 48m	1
	c. If $y = 7m$, what is the value of x? (a) 13m (b) 4m (c) 6m (d) 3m	2
37.	Case study: Students of a school are standing in rows and columns in their playground for a drill practice. A, B, C and D are the positions of four students as shown in the figure. 	
	(i) What are the coordinates of A and B respectively?	1
	(ii) What is the distance between B and D?	1
	(iii) What is the mirror image of coordinate A with respect to Y axis?	1
	(iv) If point E is (-5, -10), what is the distance of the point with respect to X axis?	1
38.	Case study: Maths teacher draws a straight line AB shown on the blackboard as per the following figure. 	

1. Now he told Raju to draw another line CD as in the figure 2. The teacher told Ajay to mark ∠AOD as 2z 3. Suraj was told to mark ∠AOC as 4y 4. Clive Made and angle ∠COE = 60° 5. Peter marked ∠BOE and ∠BOD as y and x respectively		

a. What is the value of x?
    1. 48°
    2. 96°
    3. 100°
    4. 120°
		1

b. What is the value of y?
    1. 48°
    2. 96°
    3. 100°
    4. 24°
		1

c. What should be the value of x + 2z?
    1. 148°
    2. 360°
    3. 180°
    4. 120°
		2