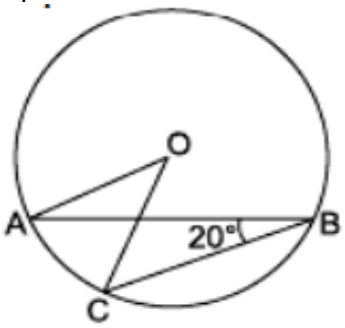
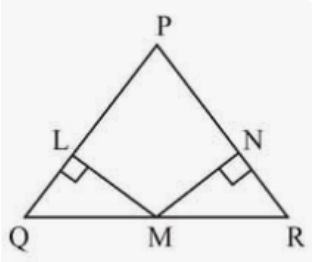
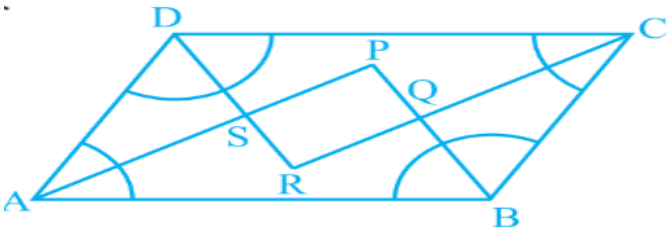
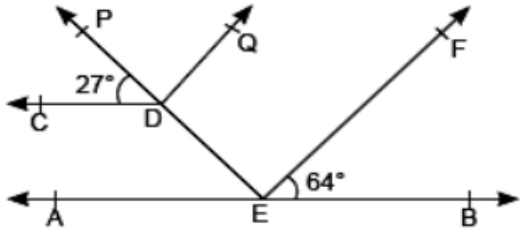
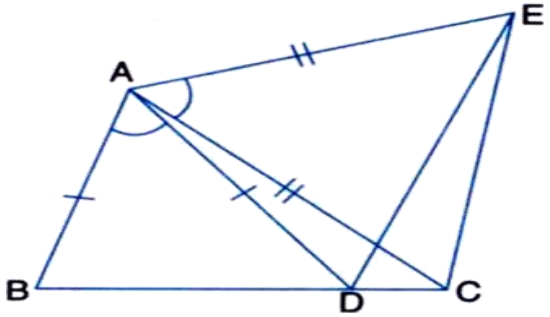
INDIAN SCHOOL SOHAR **No. of printed pages: 5**
FINAL EXAMINATION (2023-24) **No. of graph: 1**
MATHEMATICS (041)

CLASS: IX **MAX.MARKS: 80**
DATE: 15/02/24 **TIME: 3 HOURS**

General Instructions:
This Question Paper has 5 Sections A, B, C, D and E.
Section A has 20 MCQs carrying 1 mark each
Section B has 5 questions carrying 02 marks each.
Section C has 6 questions carrying 03 marks each.
Section D has 4 questions carrying 05 marks each.
Section E has 3 case based integrated units of assessment (04 marks each) with sub- parts of thevalues of 1, 1 and 2 marks each respectively.
All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E.
Draw neat figures wherever required. Take π = $\frac{22}{7}$ wherever required if not stated.

	Section A **Section A consists of 20 questions of 1 mark each.**	
1	Simplify: $\sqrt{72} + \sqrt{800} - \sqrt{18}$ (a) $29\sqrt{2}$ (b) $20\sqrt{2}$ (c) $23\sqrt{2}$ (d) $18\sqrt{2}$	1
2	The decimal expansion of irrational number is (a) Non-terminating and recurring (b) Non-terminating and non-recurring (c) Terminating (d) None of the these	1
3	The ratio of the radii of two spheres whose volumes are in the ratio 64:27 is (a) 8 : 3 (b) 16 : 9 (c) 10 : 7 (d) 4 : 3	1
4	If volume and surface area of a sphere is numerically equal, then its radius is (a) 2 units (b) 3 units (c) 4 units (d) 5 units	1
5	How much ice-cream can be put into a cone with base radius 3.5 cm and height 12 cm? (a) 176 cm^3 (b154 cm^3 (c) 124 cm^3 (d) 254 cm^3	1
6	An angle is 20^o more than three times the given angle. If the two angles are supplementary the angles are: (a) 20° , 160° (b) 50° , 130° (c) 40° , 140° (d) 70° , 110°	1
7	If the area of an equilateral triangle is 100 √3 cm^2, then the perimeter of the triangle is: (a) $4\sqrt{2}$ cm (b) 40cm (c) 400cm (d) 60 cm	1
8	Graph of x = −7 is a line (a) Parallel to y-axis (b) Parallel to x-axis (c) Passes through the origin (d) None of these	1
9.	A chord of a circle radius 5 cm subtends a right angle at the centre. The length of the chord is (a) 10cm (b) $5\sqrt{2}$ cm (c) $15\sqrt{2}$ cm (d) 3	1
10	For what value of k, the linear equation 2x + ky = 8 has x = 2 and y = 1 as its solution? (a) 5 cm (b) 4 cm (c) 12 cm (d) 10 cm	1
11	The zero of the polynomial p(x) = −5x + 5 is (a) 1 (b) 0 (c) −5 (d) −1	1

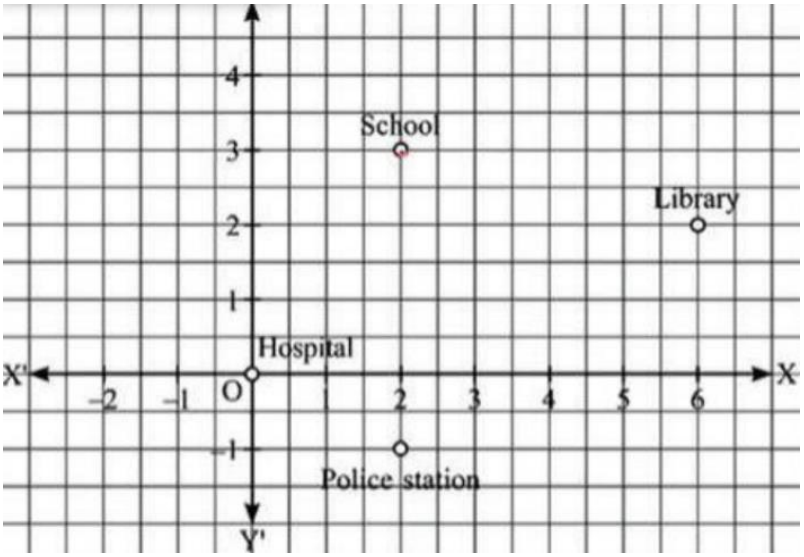
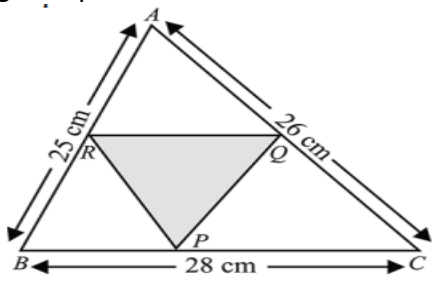
12.	If $x^2 + kx + 6 = (x + 2)(x + 3)$ for all k, find the value of k. (a) −1 (b) 1 (c) 3 (d) 5	1
13.	Euclid stated that all right angles are equal to each other in the form of (a)Definition (b) Proof c) Postulate (d) Axiom	1
14.	It is given that ΔABC ≅ΔFDE and AB= 5cm, ∠B = 40° and ∠A = 80°. Then which of the following is true? (a) DF=5cm, ∠B = 60° (b) DE=5cm, ∠E = 60° (c) DF=5cm, ∠E = 60° (d) DE=5cm, ∠D = 40°	1
15.	In figure, if ∠ABC = 20°, then ∠AOC is equal to  (a) 20° (b) 40° (c) 60° (d) 160°	1
16.	If AB=QR, BC=PR and CA=PQ, then (a) ΔABC ≅ΔPQR (b) ΔCBA ≅ΔPRQ (c) ΔBAC ≅ΔRPQ (d) ΔPQR ≅ΔBAC	1
17.	Angles of a triangle are in the ratio 2 : 4 : 3. Then sum of the smallest and largest angle of the triangle is (a) 40 (b) 180 (c) 20 (d) 120	1
18.	The class mark of the class 90 – 110 is (a) 90 (b) 110 (c) 105 (d) 100	1
Questions number 19 and 20 are Assertion and Reason based questions carrying 1 mark each. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (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 theAssertion(A). (b)Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A). (c)Assertion (A) is true, but Reason (R) is false. (d)Assertion (A) is false, but Reason (R) is true		
19	Assertion (A): 5 is a rational number. Reason (R): The square roots of all positive integers are irrationals.	1
20	Assertion (A): The point (-2, 0) lies on y -axis and (0, 4) on x -axis. Reason (R): Every point on the x -axis has zero distance from x -axis and every point on the y -axis has zero distance from y -axis.	1
Section B **Section B consists of 5 questions of 2 marks each.**		
21.	Represent $\sqrt{5}$ on the number line.	2
22.	Find the area of a triangle whose two sides are 56 cm and 60 cm and its perimeter is 168cm.	2
23.	What is the area of a triangle whose sides are 9 cm, 12 cm and 15 cm?	2

24.	Determine the volume of a conical tin having radius of the base as 30 cm and its slant height is 50 cm. (Use π=3.14) **OR** A solid sphere of radius 3 cm is melted and then recast into small spherical balls each of diameter 0.6 cm. Find the number of small balls thus obtained.	2
25.	In Δ ABC, AD is the perpendicular bisector of BC. Show that AB = AC. **OR** In the given figure, LM and MN are equal altitudes on PQ and PR respectively, M is the mid-point of QR. Prove that PQ = PR. 	2
	Section C **Section C consists of 6 questions of 3 marks each.**	
26.	Factorise : $16x^2 + 4y^2 + 9z^2 - 16xy - 12yz + 24xz$ **OR** Factorise : $27y^3 + 125z^3$	3
27.	Show that the bisectors of angles of a parallelogram form a rectangle. 	3
28.	In the given figure, EF || DQ and AB || CD. If ∠FEB = 64°, ∠PDC = 27°, then find ∠PDQ, ∠AED and ∠DEF. 	3
29.	In the given figure, AC = AE, AB = AD and ∠ BAD = ∠ EAC. Show that BC = DE.  **OR**	3

	AD is an altitude of an isosceles triangle ABC in which AB = AC. Show that (i) AD bisects BC (ii) AD bisects ∠ A.	
30.	The volume of a solid hemisphere is $1152\pi cm^3$. Find its curved surface area.	3
31.	Find the solution of the linear equation 2x + 5y = 20 which represents a point on (i) x-axis (ii) y-axis.	3
	Section D **Section D consists of 4 questions of 5 marks each.**	
32.	Simplify: $\frac{3\sqrt{2}}{\sqrt{6}-\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}} + \frac{2\sqrt{3}}{\sqrt{6}+2}$	5
33	If $x^2 + \frac{1}{x^2} = 51$, find (i) $x - \frac{1}{x}$ (ii) $x^3 - \frac{1}{x^3}$. **OR** The polynomial $ax^3 + 3x^2 - 13$ and $2x^3 - 5x + a$ leave the same remainder in each case,when divided by $x - 2$. Find the value of 'a ' .	5
34.	A survey regarding the heights (in cm) of 50 girls of class X of a school was conducted and the following data was obtained. Draw a histogram and the frequency polygon from the following data. **OR** A random survey of the number of children of various age groups playing in a park was found as follows. Draw a histogram from the following data.	5
35	Prove that the angle subtended by an arc at the center of the circle is double the angle subtended by it at any other point on the circumference of the circle.	5
	Section E **Section E has 3 case based integrated units of assessment with sub- parts of the values of 1, 1 and 2 marks each respectively**.	
36	**Case Study – 1** Manoj planned to celebrate his birthday in a small centre. He bought candies to give to children and adults. Manoj gave 3 candies to each child and 2 candies to each adult. He distributed 60 candies in total. Based on the above, answer the following questions: (i) How to represent the above situation in linear equations in two variables by taking the	

Height (in cm)	120 – 130	130 – 140	140 – 150	150 – 160	160 – 170
No. of girls	2	8	12	20	8

Age (in years)	Number of children
1-2	5
2-3	3
3-5	6
5-7	12
7-10	9
10-15	10
15-17	4

	number of children as 'x' and the number of adults as 'y'?	1
	(ii) If the number of adults is 15, then find the number of children?	1
	(iii) Find the value of b, if x = 5, y = 0 is a solution of the equation 3x + 5y = b.	2
	OR	
	(iii)Write the standard form of linear equations in two variables: y - x = 5?	
37.	**Case Study – 2**	
	Aditya is a Class IX student residing in a village. One day, he went to a city Hospital along with his grandfather for general checkup. From there he visited three places School, Library and Police Station. After returning to his village, he plotted a graph by taking Hospital as origin and marked three places on the graph as per his direction of movement and distance. The graph is shown below:	
		1
	(i) In which quadrant does the point (–1, 4) lie?	1
	(ii) What are the coordinates of the Library?	
	(iii) What is the distance between School and Library.	2
	OR	
	(iii) What is the difference between abscissa of library and ordinate of school.	
38	**Case Study – 3**	
	During a celebration in a colony, girls are asked to prepare Rangoli in triangular shape. Dimensions of ΔABC are 26 cm, 28 cm and 25 cm. Garland is to be placed along the side of ΔPQR which is formed by joining mid-points of sides of ΔABC.	
		
	i) Name the figure BPQR.	1
	(ii) In fig. R and Q are mid-points of AB and AC respectively. Find the length of RQ	1
	(iii) Find the length of the garland which is to be placed along the side of ΔPQR.	2
	OR	
	(iii) What is the perimeter of BPQR.	

*****THE END*****