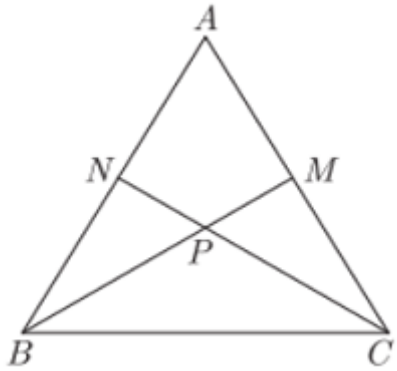
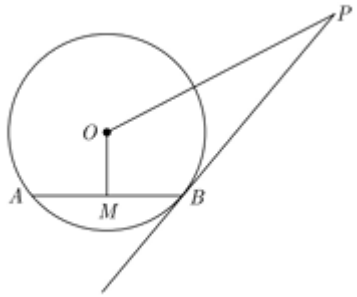
KENDRIYA VIDYALAYA SANGATHAN, ERNAKULAM REGION
PRE-BOARD QUESTION PAPER - SESSION 2026-27
CLASS X MATHEMATICS STD (041)
DURATION: 3 HOURS MAX.MARKS:80

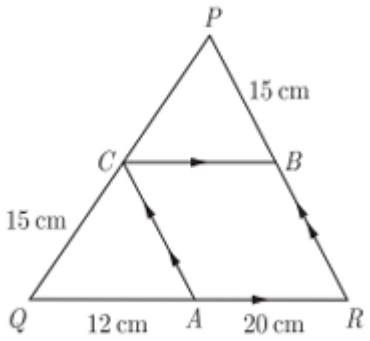
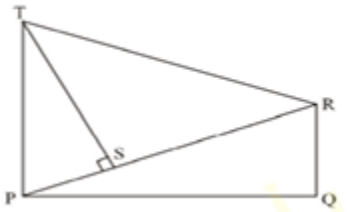
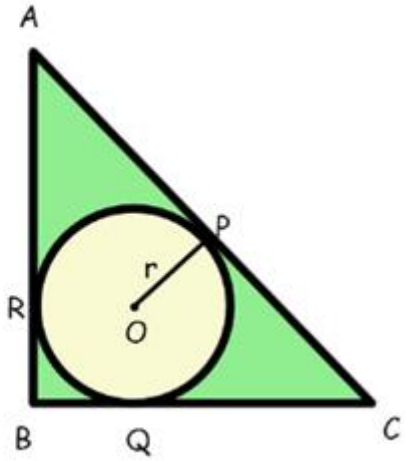
GENERAL INSTRUCTIONS:

1. This Question paper contains - five sections A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.
2. Section A has 18 MCQ's and 02 Assertion-Reason based questions of 1 mark each.
3. Section B has 5 Very Short Answer (VSA)-type questions of 2 marks each.
4. Section C has 6 Short Answer (SA)-type questions of 3 marks each.
5. Section D has 4 Long Answer (LA)-type questions of 5 marks each.
6. Section E has 3 source based/case based/passage based/integrated units of assessment of 4marks each with sub-parts.

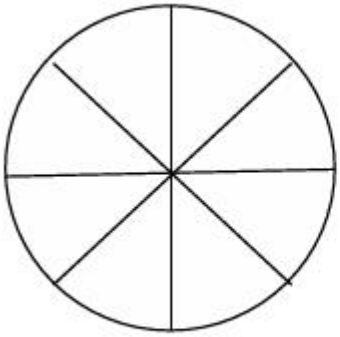
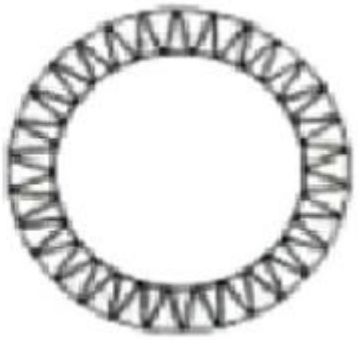
Q. No.	***SECTION – A (Multiple Choice Questions)***	Marks
Q 1.	Which of these numbers can be expressed as a product of two or more prime numbers (i)153 (ii) 1275 (iii)791 (a) only (ii) (b) only (i) (c) only (i) (ii) (d) all (i) (ii) (iii)	1
Q 2.	If zeroes of the polynomial $\mathbf{px^2-qx-5}$ are reciprocal to each other , then : (a) q = 5 (b) p = -5 (c) p-q=0 (d) p + q = 0	1
Q 3.	Kanika has only **₹1** and **₹2** coins with her. If the total number of coins that she has is 50 and the amount of money with her is ₹75, then the number of ₹1 and ₹2 coins are respectively (a) 25 and 25 (b) 15 and 35 (c) 35 and 15 (d) 35 and 20	1
Q 4.	If a clock strikes once at one O'clock, twice at two O'clock, thrice at 3 0'clock and so on and again once at one O'clock and so on, then how many times will the bell be struck in the course of 2 days (a) 156 (b) 312 (c) 78 (d) 288	1
Q 5.	XY is drawn parallel to the base BC of a ΔABC cutting AB at X and AC at Y .If AB = 4BX and YC=2cm , then AY= (a)2 cm (b)6cm (c)8 cm (d)4cm	1
Q 6.	A vertical pole of length 20 m casts a shadow 10 m long on the ground and at the same time a tower casts a shadow 50 m long, then the height of the tower. (a) 100 m (b)120m (c)25m (d)50m	1
Q 7.	Consider the equation $kx^2 + 2x = c(2x^2 + b)$. for the equation to be quadratic ,which of these cannot be value of k ? (a) 2c (b) 3c (c) 4c (d) 2c+2b	1
Q 8.	Three vertices of a parallelogram taken in order are (- 1, - 6), (2, - 5) and (7, 2). The fourth vertex (a)(1,4) (b)(1, 1) (c)(4,4) (d)(4,1)	1
Q 9.	If the point P(2,1) lies on the line segment joining points A(4,2) and B(8,4),then (a)AP=$\frac{1}{3}$AB (b) PB=$\frac{1}{3}$AB (c) AP=PB (d) AP=$\frac{1}{2}$AB	1
Q 10.	The points (–4, 0), (4, 0), (0,3) are the vertices of a: (a)Right triangle (b)Isosceles triangle (c)Equilateral triangle (d)Scalene triangle	1
Q 11.	If the zeroes of the quadratic polynomial $x^2 + (a + 1)x + b$ are 2 and – 3, then (a) a = – 7, b = – 1 (b) a = 5, b = – 1 (c) a = 2, b = – 6 (d) a = 0, b = – 6	1

Q 12.	In ΔOPQ, right-angled at P, OP=7cm and OQ–PQ=1cm, then the values of sinQ. (a)$\frac{7}{25}$ (b) $\frac{24}{25}$ (c) $\frac{24}{7}$ (d) $\frac{1}{7}$	1
Q 13.	If Δ*ABC* is right angled at B, then the value of cos(A+C) is (a)0 (b)1 (c)½ (d) not defined	1
Q 14.	If the angles of elevation of a tower from two points distant a and b (a > b) from its foot and in the same straight line from it are 30^0 and 60^0, then the height of the tower is (a) $\sqrt{a+b}$ m (b) $\sqrt{a-b}$ m (c) $\sqrt{ab}$ m (d) $\sqrt{\frac{a}{b}}$ m	1
Q 15.	The string of a kite is 100m long and it makes an angle of 60^0 with the horizontal. Find the height of the kite, assuming that there is no slack in the string. (a)100 $\sqrt{3}$ m (b)$\frac{200}{\sqrt{3}}$m (c) $50\sqrt{3}$ m (d) $\frac{100}{\sqrt{3}}$ m	1
Q 16.	A solid sphere of radius r cm is melted and recast into the shape of a solid cone of height r. Then the radius of the base of cone is (a)2r (b)r (c)4r (d)3r	1
Q 17.	The difference between the circumference and the radius of a circle is 37cm. Find the area of the circle. (a) $111cm^2$ (b)$184cm^2$ (c) $154cm^2$ (d)$259cm^2$	1
Q 18.	ABCD is a cyclic quadrilateral in which BC is parallel to AD, ∠ADC=110^0 and ∠BAC=50^0. Find ∠DAC (a) 80º (b)60º (c) 90º (d)170^0	
	ASSERTION-REASON BASED QUESTIONS In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices. (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.	
Q 19.	Assertion (A): For $0 \leq \theta \leq 90°$, $sec\ x + cos\ x \geq 2$ Reason (R): For any x > 0, $x + \frac{1}{x} \geq 2$	1
Q 20.	Assertion (A): The lengths of tangents drawn from an external point to a circle are not equal. Reason (R): the line segments' joining the points of contact of two parallel tangents is a diameter of the circle.	1
	Section –B [This section comprises of very short answer type questions (VSA) of 2 marks each]	
Q 21.	The length, breadth and height of a room are 8 m 25 cm, 6 m 75 cm and 4 m 50 cm respectively. Determine the longest rod which can measure the three dimensions of the room exactly.	2

Q 22.	In the figure, AM: MC =3:4, BP:PM =3:2 and BN = 12 cm. Then find AN. 	2
Q 23.	In a seating arrangement of desks in a classroom, three students are seated at A (3, 1), B (6,4) and C (8, 6) respectively. Are they seated in line?	2
Q 24.	If tan 3x = sin45° cos45° + sin30° then value of x is?	2
Q 25.	A ceiling fan has 3 wings. Find the length of the arc described between two consecutive wings, where length of each wing is 0.98 m.	2
	Section – C [This section comprises of short answer type questions (SA) of 3 marks each]	
Q 26.	Prove that 2-7√3 is an irrational number, given that √3 is an irrational number.	3
Q 27.	If α and β are the zeroes of the polynomial $p(x) = 4x^2-5x+1$, find a quadratic polynomial whose zeroes are $\frac{\alpha^2}{\beta}$ and $\frac{\beta^2}{\alpha}$.	3
Q 28.	If mth term of an AP is $\frac{1}{n}$ and nth term is $\frac{1}{m}$. Show that (mn) th term of this AP is 1.	3
Q 29.	Find the ratio in which the line segment joining A (1, – 5) and B (- 4, 5) is divided by the x axis. Also find the coordinates of the point of division.	3
Q 30.	Prove that $\frac{\sin\emptyset}{1+cos\emptyset} + \frac{1+cos\emptyset}{\sin\emptyset} = 2\text{cosec}\emptyset$	3
Q 31.	PB is a tangent to the circle with centre O to B. AB is a chord of length 24 cm at a distance of 5 cm from the centre. It the tangent is of length 20 cm, find the length of PO. 	3
	Section –D [This section comprises of long answer type questions (LA) of 5 marks each]	
Q 32.	Madhav has a field with total area 1260 square metre. He uses it to grow wheat and rice. The land used to grow wheat is rectangular in shape while the rice land is in the shape of a square. The length of wheat land is 3m more than twice the length of Rice land. Find the area of wheat land.	5

Q 33.	(a) In the given figure below, CB || QR and CA || PR Also AQ = 12 cm, AR = 20 cm, PB = CQ = 15 cm. Calculate PC and BR.  (b) In the given figure, RQ and TP are perpendicular to PQ, also TS perpendicular to PR. Prove that ST.RQ = PS.PQ  	3 2
Q 34.	A man standing on the deck of the ship, which is 16m above the water level, observes the angle of elevation of the top of the clip as 60° and the angle of depression of the base of the cliff as 30°. Calculate the distance of the cliff from the ship and height of the cliff.	5
Q 35.	A metallic cylinder has radius 3cm and height 5cm. To reduce its weight, a conical hole is drilled in the cylinder. The conical hole is drilled in the cylinder. The conical hole has a radius of 3/2 cm. and its depth is 8/9cm. Calculate the ratio of the volume of metal left in the cylinder to the volume of metal taken out in the conical shape.	5
	Section –E [This section comprises of 3 case- study/passage based questions of 4 marks each with Sub-parts.]	
Q 36.	A playground is in the shape of a triangle with right angle at B, AB = 3m and BC = 4m. A pit was dig inside it such that it touches the walls AC, BC and AB at P, Q and R, respectively such that AP = x m.   Based on the above information, answer the following questions.	1

	i. The value of AR = (a) 2x m (b) x / 2 m (c) x m (d) 3x m ii. the value of BQ= (a) 2x m (b) (3 − x) m (c) (2 − x) m (d) 4x m iii. The value of CQ= (a) (4 + x) m (b) (5 − x) m (c) (1 + x) m (d) Both (b) and (c) iv. Which of the following is correct? (a) Quadrilateral AROP is a square (b) Quadrilateral BROQ is a square (c) Quadrilateral CQOP is a square (d) Quadrilateral AROP is rhombus OR v. Radius of the pit is (a) 1 m (b) 3 m (c) 4 m (d) 5 m	1 1 1
Q 37.	A test consists of 'True' or 'False' questions. One mark is awarded for every correct answer while 1⁄4 mark is deducted for every wrong answer. A student knew answers to some of the questions. Rest of the questions he attempted by guessing. He answered 120 questions and got 90 marks. 1. If answer to all questions he attempted by guessing were wrong, then how many Questions did he answer correctly? 2. How many questions did he guess? 3. If answer to all questions he attempted by guessing were wrong and answered 80 Correctly, then how many marks he got? OR 3. If answer to all questions he attempted by guessing were wrong, then how many Questions answered correctly to score 95 marks?	1 1 2

Q 38.	A brooch is a small piece of jewellery which has a pin at the back so it can be fastened on a dress, blouse or coat. Designs of some brooch are shown below. Observe them carefully.  A  B Design A; Brooch A is made with silver wire in the form of a circle with diameter 28 mm. The wire is used for making 4 diameters which divide the circle into 8 equal parts. Design B; Brooch B is made up of 2 colours. Gold and Silver. Outer part is made with gold. The circumference of silver part is 44 mm and the gold part is 3 mm wide everywhere. Refer to Design A (i) Find the total length of silver wire required (ii)Find the area of each sector of the brooch **REFER TO DESIGN B;** (iii) Find the circumference of the outer part (golden) (iv) A boy is playing with Brooch B; He makes revolutions with it along its edge. How many complete revolutions must it take to cover 80π mm?	1 1 1 1