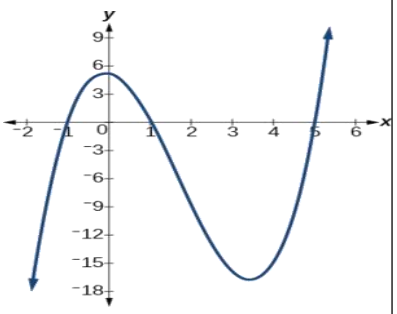
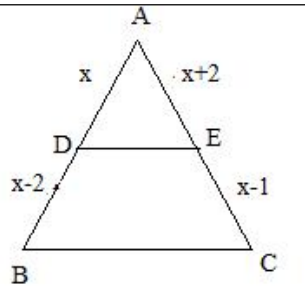
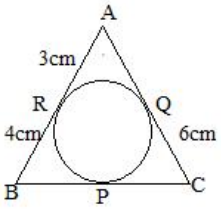
KENDRIYA VIDYALAYA SANGATHAN
ERNAULAM REGION
PRE BOARD EXAMINATION
Class X Session 2026-27
MATHEMATICS STANDARD (Code No.041)

TIME: 3 hours MAX.MARKS: 80

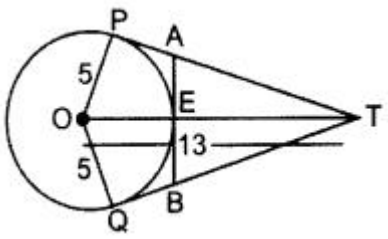
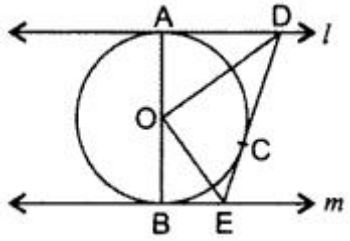
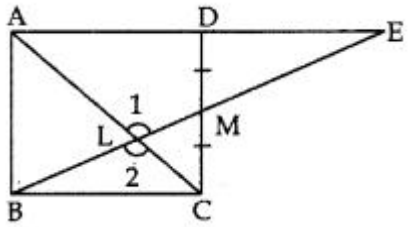
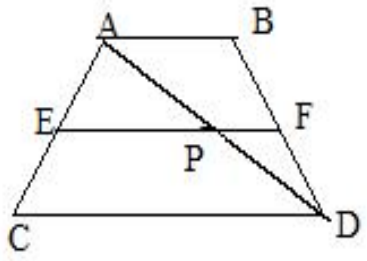
General Instructions: 1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3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

1.	**Two** school bells ring at intervals of 18 minutes and 24 minutes respectively. They ring together at 8:00 a.m. At what time will they next ring together? (a) 8:36 a.m. (b) 8:48 a.m. (c) 9:12 a.m. (d) 9:36 a.m	1
2.	The number of zeros lying between -2 and 6 of the polynomial f(x) whose graph is given:  (a) 1 (b) 2 (c) 3 (d)4	1
3	Two cab services charge ₹50 + ₹12x and ₹80 + ₹9x respectively for a ride of x km. At what distance will the two fares be equal? (a) 8 km (b) 10 km (c) 12 km (d) 15 km	1
4	If the sides of the right triangle are x, x+2, x+4 (where x>0), then x is (a) 6 (b)8 (c)10 (d)12	1
5	If the sum of three numbers in AP is 36, then middle term is (a) 12 (b)15 (c)18 (d)9	1
6.	If two positive integers A and B can be expressed as $A = xy^3$ and $B = x^4y^2z$; x, y being prime numbers then HCF (A, B) is (a) xy^2 (b) x^4y^2z (c) x^4y^3 (d) x^4y^3z	1
7.	A rescue drone moves along the straight line joining A(2, 3) and B(8, 11). The coordinates of the midpoint of AB are	1

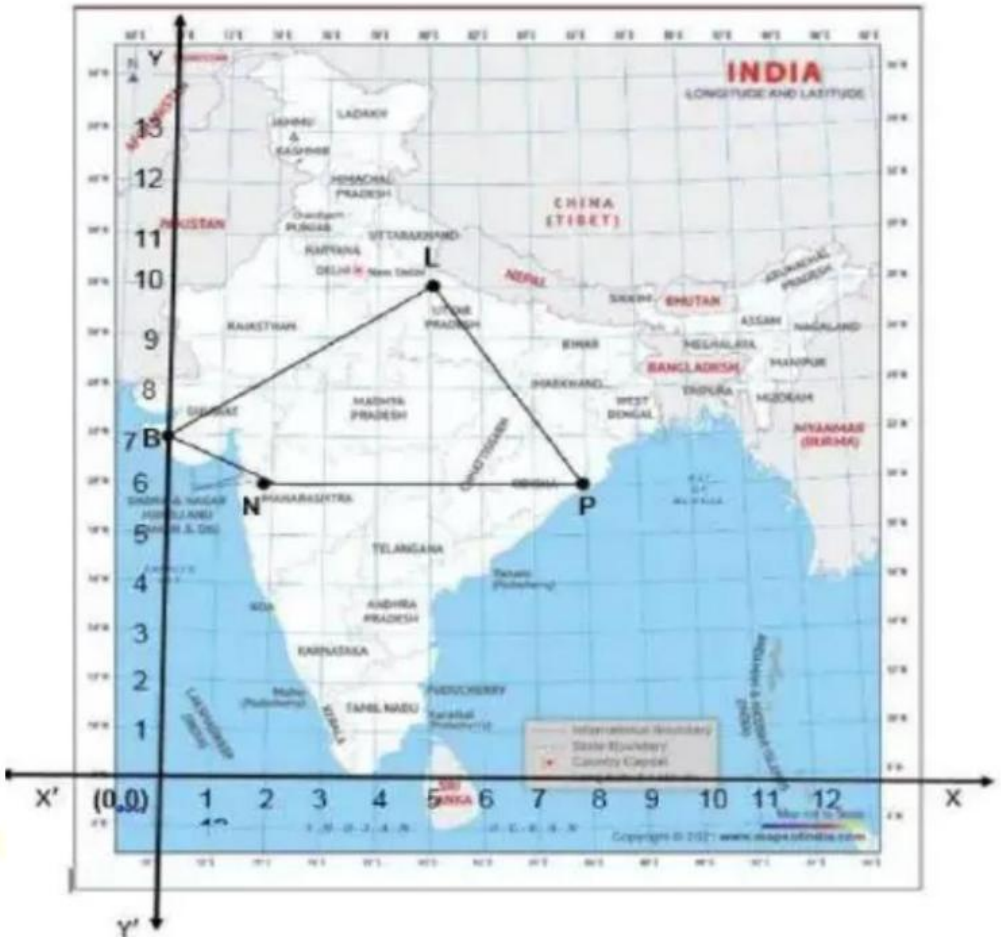
	(a) (4, 6) (b) (5, 7) (c) (6, 8) (d) (3, 5)	
8.	 Find the value of x: (a)4 (b)5 (c)3 (d)2	1
9	The length of tangent drawn to a circle of radius 16cm from a point 34 cm from the centre is (a)30cm (b) 32cm (c) 34 cm (d) 50cm	1
10	In fig., triangle ABC is circumscribing a circle Then length of BC is :  (a)7 (b)8 (c)9 (d)10	1
11.	If Sin A + Cosec A=2, then $Sin^2A+Cosec^2A$=: (a)4 (b)2 (c)0 (d)1	1
12.	If ΔABC ~ ΔDEF and ΔABC is not similar to ΔDEF then which of the following is not true? (a) BC.EF = AC.FD (b) AB.ED = AC.DE (c) BC.DE = AB.EE (d) BC.DE = AB.FD	1
13.	The value of k, for which the system of equations x + (k + 1)y = 5 and (k + 1)x + 9y = 8k – 1 has infinitely many solutions is a) 2 (b) 3 (c) 4 (d) 5	1
14.	If the perimeter and area of a circle are equal ,then the radius of the circle is: (a)2 units (b) 4 units (c) π units (d) 7 units	1
15.	The HCF and LCM of two numbers are 33 and 264 respectively. When the first number is completely divided by 2 the quotient is 33. The other number is: (a) 66 (b) 130 (c) 132 (d) 196	1

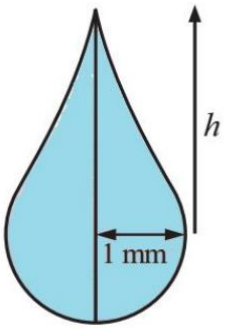
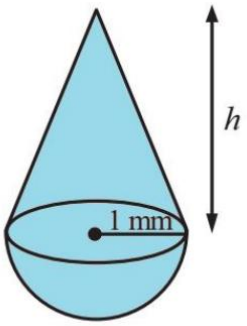
16	The decimal expansion of the rational number $\frac{14587}{1250}$ will terminate after (a) one decimal place (b) two decimal places (c) three decimal places (d) four decimal places	1
17.	If the roots of $px^2 + qx + 2 = 0$ are reciprocal of each other, then (a) p = 0 (b) p = -2 (c) p = ±2 (d) p = 2	1
18	If (a/3, 4) is the mid-point of the segment joining the points P(-6, 5) and R(-2, 3), then the value of 'a' is (a) 12 (b) -6 (c) -12 (d) -4	1
19.	**Statement A** (Assertion): If volume of two spheres are in the ratio 64:27, then the ratio of their surface area is 4:3 **Statement R**(Reason): Volume of a Right circular cylinder is πr^2h (a) Both assertion A and reason R are true and reason R is the correct explanation of assertion A (b) Both assertion A and reason R are true and reason R is not the correct explanation of assertion A (c) Assertion (A) is true but reason (R) is false (d) Assertion (A) is false but reason (R) is true	1
20	**Statement A** (Assertion): 25^{th} term of an AP 4,9,14,19…….is124. **Statement R** (Reason): n^{th} term of an AP is given by $a_n = a+(n-1)d$ (a) Both assertion A and reason R are true and reason R is the correct explanation of assertion A (b) Both assertion A and reason R are true and reason R is not the correct explanation of assertion A (c) Assertion (A) is true but reason (R) is false (d) Assertion (A) is false but reason (R) is true	1
	SECTION B	
	Section B consists of 5 questions of 2 marks each	
21	The product of two consecutive positive integers is 306. Find the integers.	2
22	If the point (0, 2) is equidistant from the points (3, k) and (k, 5), find the value of k.	2
	OR	
	If A(-2, 1), B(a, 0), C(4, b) and D(1, 2) are the vertices of a parallelogram ABCD,	

	find the values of a and b. Hence, find the lengths of its sides.	
23	Two right triangles ABC and DBC are drawn on the same hypotenuse BC and on the same side of BC. If AC and BD intersect at P. Prove that AP × PC = BP × PD.	2
24	If tan (A+B) =$\sqrt{3}$ and tan (A-B)= $1/\sqrt{3}$; $0^0 < A+B < 90^0$;A > B,find A and B	2
25	Find the area of circle that can be inscribed in a square of side 6cm.	2
	OR	
	The circumference of a circle is 22cm.Find the area of its quadrant(in cm^2)	
	SECTION C	
	Section C consists of 6 questions of 3 marks each	
26	A student is asked whether the number $\sqrt{3}$ can be expressed in the form p/q, where (p) and (q) are integers and $q \neq 0$. The student says, "Since 3 is a whole number, $\sqrt{3}$ must also be a rational number." Do you agree with the student? Give a mathematical justification for your answer by proving that $\sqrt{3}$ is irrational.	3
27	If α and β are the zeros of the quadratic polynomial $p(x)=2x^2+7x+5$ then evaluate $\frac{\alpha}{\beta}+\frac{\beta}{\alpha}$	3
28	Solve for x and y. 47x + 31y=63 31x + 47y=15	3
29.	If secΘ +tan Θ= p, show that $\frac{p^2-1}{p^2+1}=\sin\Theta$	3
	OR	
	Prove that: $\frac{\sqrt{1+\sin A}}{\sqrt{1-\sin A}}+\frac{\sqrt{1-\sin A}}{\sqrt{1+\sin A}}=2\sec A$ $=2(\sin A \tan A+\cos A)$	
30	In the figure, O is the centre of a circle of radius 5 cm. T is a point such that OT = 13 cm and OT intersects circle at E. If AB is a tangent to the circle at E, find the length of AB, where TP and TQ are two tangents to the circle.	3

		
	OR	
	In the figure, l and m are two parallel tangents to a circle with centre O, touching the circle at A and B respectively. Another tangent at C intersects the line I at D and m at E. Prove that ∠DOE = 90°. 	
31	 In figure, M is mid-point of side CD of a parallelogram ABCD. The line BM is drawn intersecting AC at L and AD produced at E. Prove that EL = 2BL	3
	SECTION D	
	Section D consists of 4 questions of 5 marks each	
32.	(a)Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in the distinct points , then the other two sides are devided in the same ratio (b) In fig, EF||AB||DC . Prove that $\frac{AE}{EC} = \frac{BF}{FD}$ 	5
33	A fast train takes 3 hours less than a slow train for journey of 600 km. If the speed of the slow train is 10 km/hr less than that of the fast train, find the speed of two trains	5

	OR	
	Solve for x: $\frac{1}{2a+b+2x} = \frac{1}{2a} + \frac{1}{b} + \frac{1}{2x}$	
34	The angle of elevation of a cloud from a point 60 m above the surface of the water of a lake is 30° and the angle of depression of its shadow in water of lake is 60°. Find the height of the cloud from the surface of water.	5
	OR	
	A man is standing on the deck of a ship, which is 8 m above water level. He observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of the hill as 30°. Calculate the distance of the hill from the ship and the height of the hill.	
35	Due to heavy floods in a state, thousands were rendered homeless. 50 schools collectively decided to provide place and the canvas for 1500 tents and share the whole expenditure equally. The lower part of each tent is cylindrical with base radius 2.8 m and height 3.5 m and the upper part is conical with the same base radius, but of height 2.1 m. If the canvas used to make the tents costs ₹120 per m2 , find the amount shared by each school to set up the tents.	5
	SECTION E	
36	Adiyogi Shiva Statue, Coimbatore (Tamil Nadu): The Adiyogi Shiva statue at the Isha Yoga Centre stands 34 m tall, built to mark the 112 ways of attaining moksha mentioned in yogic culture. A devotee standing on level ground looks up at the top of the statue's head with an angle of elevation of 45° 	
	(a) Find the distance of the devotee from the base of the statue	1
	(b) Find the distance between the devotee's eye and the top of the statue (i.e., the line of sight, assuming the devotee's height is negligible).	1
	(c) Another devotee stands twice as far from the base. Will the angle of elevation from this point be more, less, or exactly half of 45°? Justify.	2
	OR	
	(d) A visitor stands exactly at a distance equal to the height of the 34 m Adiyogi statue (i.e., 34 m from its base) What is the angle of elevation of the top of the statue from this point?	
	In a GPS, The lines that run east-west are known as lines of latitude, and the lines	

37	running north-south are known as lines of longitude. The latitude and the longitude of a place are its coordinates and the distance formula is used to find the distance between two places. The distance between two parallel lines is approximately 150 km. A family from Uttar Pradesh planned a round trip from Lucknow (L) to Puri (P) via Bhuj (B) and Nashik (N) as shown in the given figure below Based on the above information answer the following questions using the coordinate geometry.  	
	a) Find the distance between Lucknow (L) to Bhuj(B)	1
	b) If Kota (K), internally divide the line segment joining Lucknow (L) to Bhuj (B) into 3 : 2 then find the coordinate of Kota (K).	1
	c) Name the type of triangle formed by the places Lucknow (L), Nashik (N) and Puri (P) OR d) Find a place (point) on the longitude (y-axis) which is equidistant from the points Lucknow (L) and Puri (P).	2
	In the month of December 2020, it rained heavily throughout the day over the city of Hyderabad. Anil observed the raindrops as they reached him. Each raindrop was in the shape of a hemisphere surmounted by a cone of the same radius of 1 mm. Volume of one of such drops is 3.14 mm^3. Anil collected the rain water in a pot having a capacity of 1099 cm^3. [Use $\sqrt{2}$ = 1.414]	

	  	
	(a) Find the total height of the drop.	1
	b)How many drops will fill the pot completely.	1
	(c) As the drop fell into the pot, it changed into a sphere. What was the radius of this sphere? OR d)Find the curved surface area of the drop	2