अनुक्रमांक / **ROLL NO** सेट / **SET: A**

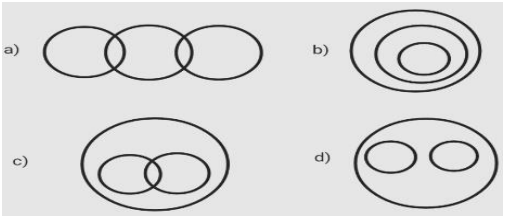
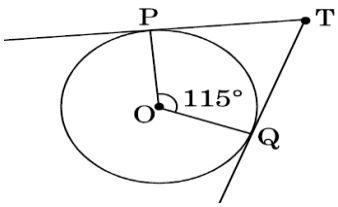
केंद्रीय विद्यालय संगठन, जयपुर संभाग
KENDRIYA VIDYALAYA SANGATHAN ,JAIPUR REGION
PRACTICE PAPER : 2024-25
कक्षा / CLASS : 10
विषय / SUB: MATHEMATICS STANDARD (कोड / CODE : 041)

अधिकतम आवधि / Time Allowed: 3 Hours **अधिकतम अंक/ Maximum Marks: 80**

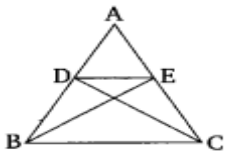
सामान्य निर्देश / General Instructions:

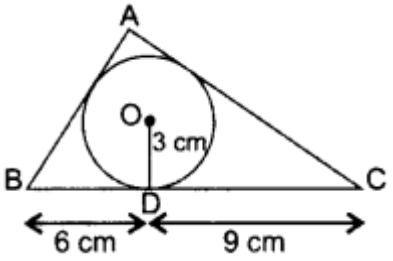
Read the following instructions carefully and follow them:

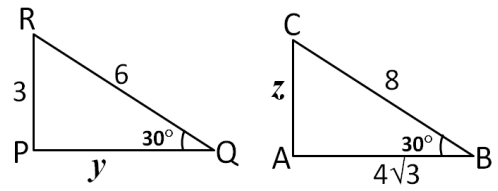
1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Questions no. 21-25 are very short answer (VSA) type questions, carrying 02 markseach.
5. In Section C, Questions no. 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 36-38 are case study based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 2 Question of Section B, 2 Questions of Section C and 2 Questions of Section D has been provided. An internal choice hasbeen provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take π =22/7 wherever required if not stated.
11. Use of calculators is not allowed.

	Section A	
S.NO.	**Section A consists of 20 questions of 1mark each.**	MARKS
1	Which one of the following venn diagram is the correct depiction of the relationship between rational, irrational and real numbers?  	1
2	What is the quadratic polynomial whose sum and the product of zeroes is $\sqrt{2}$, ⅓ respectively? (a) $3x^2 - 3\sqrt{2}x + 1$ (b) $3x^2 + 3\sqrt{2}x + 1$ (c) $3x^2 + 3\sqrt{2}x - 1$ (d) None of the above	1
3	If -1 and 5 are the zeroes of quadratic polynomial $x^2 + (q-3)\,x + p$, then p and q are respectively (a) -5,-2 (b) 5,8 (c) –1,-5 (d) 2 , 6	1
4	The pair of equations given by $y + 2x = 8$ and $2x + 4y - 16 = 0$ represents two lines which are: (a) parallel. (b) coincident. (c) intersecting at exactly one point. (d) intersecting at exactly two points	1
5	The distance between the points (2, – 3) and (– 3, 2) is (a) $5\sqrt{2}$ units (b) $\pm 5\sqrt{2}$ units (c) 50 units (d) ± 50 units	1
6	If $\Delta ABC \sim \Delta DEF$ and AB = 6cm, BC = 7cm, CA = 8cm and DE= 12cm, then perimeter of ΔDEF is: (a) 42 cm (b) 35 cm (c) 25 cm (d) 30 cm	1
7	$sin^2A + cos^2A = 1$ is true when A is equal to: (a)any angle (b) 90° (c) 0° (d) 45°	1
8	Value of $\frac{1}{\sqrt{2}}cos45°(1 + tan^2 45°)$ is equal to: (a) sin 90° (b) cos 90° (c) tan 30° (d) sin 45°	1
9	In the given figure, TP and TQ are tangents drawn to the circle with centre at O. If ∠POQ = 115° then ∠PTQ is:  (a) 115° (b) 57·5° (c) 55° (d) 65°	1

10	If $\Delta PQR \sim \Delta XYZ$ is such that PQ=4cm and XY= 8cm and the perimeter of ΔPQR is 24cm, find the perimeter of ΔXYZ. (a) 36cm (b) 48cm (c) 42cm (d) 32cm	1
11	LCM of smallest prime and smallest composite number is: (a) 1 (b) 2 (c) 3 (d) 4	1
12	If the areas of two circles are in ratio 16:25, then the ratio of their radii is: (a) 4 :5 (b) 5 :4 (c) 25:16 (d) 2:3	1
13	If the surface areas of two spheres are in ratio 4 : 9, then the ratio of their volumes is: (a) 8 : 27 (b) 16:25 (c) 2 : 3 (d) 9 :4	1
14.	The median and mode of a distribution are 14 and 16, respectively. The value of the mean is: (a) 17 (b) 18 (c) 13 (d) 15	1
15	If the circumference of a circle increases from 2π to 4π then its area becomes _____ the original area (a) Half (b) Double (c) Three times (d) Four times	1
16	For the following distribution : Class: 0 - 5 | 5 -10 | 10-15 | 15-20 | 20 -25 Frequency: 11 | 28 | 24 | 18 | 19 the upper limits of the modal class is (a)10 (b) 15 (c) 20 (d) 25	1
17	A card is selected at random from a well shuffled deck of 52 cards. The probability of its being a black coloured face card is (a) $\frac{3}{26}$ (b) $\frac{3}{13}$ (c) $\frac{2}{13}$ (d) $\frac{1}{2}$	1
18	If $4\sin^2\theta - 3 = 0$, then θ is equal to (a)30° (b) 45° (c) 60° (d) 90°	1
	Direction for questions 19 & 20: In question numbers 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.	
19	**Assertion(A):** The centroid of a triangle divides each median in the ratio 2:1 **Reason(R)**: The centroid is the point where the medians intersect. (a) Both Assertion (A) and Reason(R) are true and Reason(R) is the	1

	correct explanation of Assertion (A). (b) Both Assertion (A) and Reason (R) are true but 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.	
20.	**Assertion(A):** If product of two numbers is 360 and their HCF is 12, then their LCM is 30. **Reason (R): The** HCF and LCM of two numbers is always same. (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 but 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.	In the given figure, if ∆ABE ≅∆ACD, show that ∆ADE ~ ∆ABC. 	2
22.	Find the value(s) of *k* so that the pair of equations $3x - 2y = 7$ and $kx + y = 5$ has no solution.	2
23	Prove that the lengths of two tangents drawn from an external point to a circle are equal.	2
24	A goat is tethered at a point on the boundary of a circular garden with a radius of 10 m by a rope that is 4 m long. Calculate the area of the garden that the goat can access for grazing. **OR** The radii of two circles are 8 cm and 6 cm, respectively. Find the radius of circle having area equal to the sum of the areas of the two circles.	2
25	Find an acute angle $\boldsymbol{\theta}$ when $\frac{\cos\theta - \sin\theta}{\cos\theta + \sin\theta} = \frac{1-\sqrt{3}}{1+\sqrt{3}}$ **OR** If sin (A - B) = $\frac{1}{2}$ and cos (A+B) = $\frac{1}{2}$, 0°< A+B ≤ 90° and A> B, then find the measures of angles A and B.	2
	SECCTION C	
	Section C consists of 6 questions of 3 marks each.	
26.	Prove that $\sqrt{2} + \sqrt{3}$ is an irrational number.	3

27	If α and $\frac{1}{\alpha}$ are the zeros of the polynomial $4x^2 - 2x + (k - 4)$,find the value of k	3
28	Prove the following: $\frac{\sin A - 2\sin^3 A}{2\cos^3 A - \cos A} = \tan A$	3
29	A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid Rs.27 for a book kept for seven days, while Susy paid Rs.21 for the book she kept for five days. Find the fixed charge and the charge for each extra day.	3
30	Prove that- the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the centre. **OR** In the figure, a ∆ABC is drawn to circumscribe a circle of radius 3 cm, such that the segments BD and DC are respectively 6 cm 9 cm of lengths 6 cm and 9 cm. If the area of ∆ABC is 54 cm^2, then find the lengths of sides AB and AC.  	3
31	A box contains 100 discs numbered from 1 to 100. If one disc is drawn at random, find the probability that it bears: (i) An even number. (ii) A number greater than 75. (iii) A perfect cube number.	 1 1 1
	SECTION D	
	Section D consists of 4 questions of 5marks each.	
32	A motor boat whose speed is 20 km/h in still water, takes 1 hour more to go 48 km upstream than to return downstream to the same spot. Find the speed of the stream. **OR** In a flight of 600 km, an aircraft was slowed due to bad weather. Its average speed for the trip was reduced by 200 km/hr and the time of flight increased by 30 minutes. Find the original duration of the flight.	5
33	a) Prove that -If a line is drawn parallel to one side of a triangle, it divides the other two sides proportionally. b) In the figure △ABC ~ △PQR, find value of *y* + *z.*	3+2



35. The median of the following data is 137. Find the values of x and y, If the total frequency is 68. [5]

Class Intervals	65-85	85-105	105-125	125-145	145-165	165-185	185-205
Frequency	4	x	13	20	14	y	4

SECTION E

36 The students of Class X are designing a playground for their school in the shape of a quadrilateral plot. The coordinates of the playground are marked as A(2,3) , B(10,6) , C(8,-4) and D(3,-6) . They want to divide the playground into triangular sections and assign each group of students to work on one section.

Answer the following questions:

(i) Using the distance formula, calculate the lengths of sides AB and BC to help students plan their triangular sections. [1]

(ii) Calculate the distance between diagonally opposite points A and C. [1]

(iii) Find the coordinates of the midpoint of line segment AC. [2]

OR

Find the coordinates of the centroid of triangle .

37 A group of friends plans to build a treehouse in a local park. The treehouse is designed to be 6 meters tall. They want to ensure the structure is safe and stable, so they decide to calculate the height from which they need to lower a ladder at a specific angle to reach the treehouse.

(i) If they position the base of the ladder 6 meters away from the base of the treehouse, what angle should the ladder make with the ground to reach the top of the treehouse? [1]

(ii) If they want to extend the ladder's reach by 2 meters, how far from the base of the treehouse should the new position of the ladder be placed if angle is 60^0? ($\sqrt{3} = 1.73$) [1]

(iii) If the treehouse has a roof slanting at an angle of elevation of 30°, what will be the height of the roof from the ground? ($\sqrt{3} = 1.73$) [2]

OR

If the tops of two tree houses of height x and y, subtend angles of elevation

	of 30° and 60° respectively at the centre of the line joining their feet on level of ground, then find x : y.	
38	A company manufactures two types of chairs: wooden and plastic. In the first year, they produced 150 wooden chairs and 250 plastic chairs. The production of wooden chairs increases by 20 each year, while the production of plastic chairs increases by 30 each year. They want to analyze: (i) How many wooden chairs will be produced in the fifth year? (ii) In which year will the production of plastic chairs reach 400? (iii) What is the total production of both types of chairs over the first four years? **OR** How many natural numbers are there between 200 and 500, which are divisible by 7? 	1 1 2