

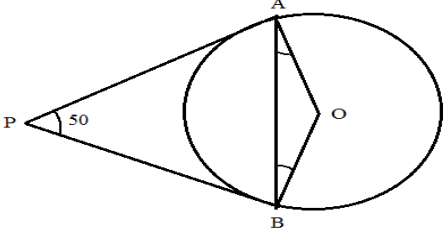
KENDRIYA VIDYALAYA SANGATHAN JAMMU REGION
PREBOARD-2 SET 1(2025-26)
CLASS- X
SUBJECT- MATHEMATICS (STANDARD)

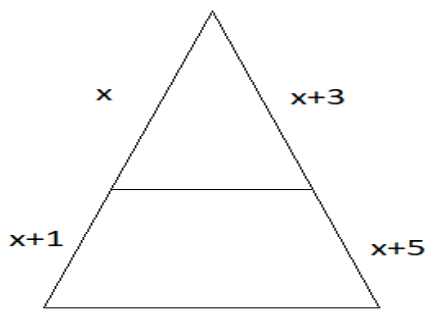
Maximum Marks: 80
Time Allowed- 3 hrs

General Instructions:

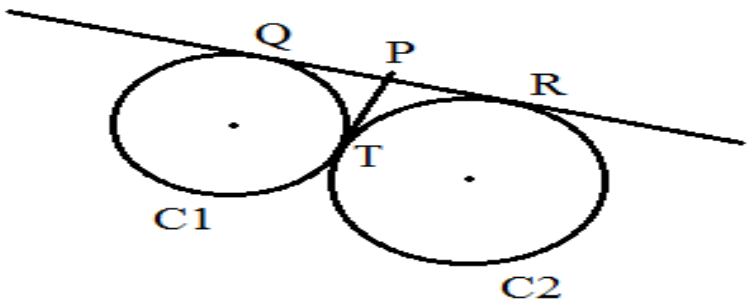
1. This Question Paper has 5 Sections A, B, C, D, and E.
2. Section A has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.
3. Section B has 5 Short Answer-I (SA-I) type questions carrying 2 marks each.
4. Section C has 6 Short Answer-II (SA-II) type questions carrying 3 marks each.
5. Section D has 4 Long Answer (LA) type questions carrying 5 marks each.
6. Section E has 3 Case Based integrated units of assessment (4 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 2 marks, 2 Qs of 3 marks and 2 Questions of 5 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

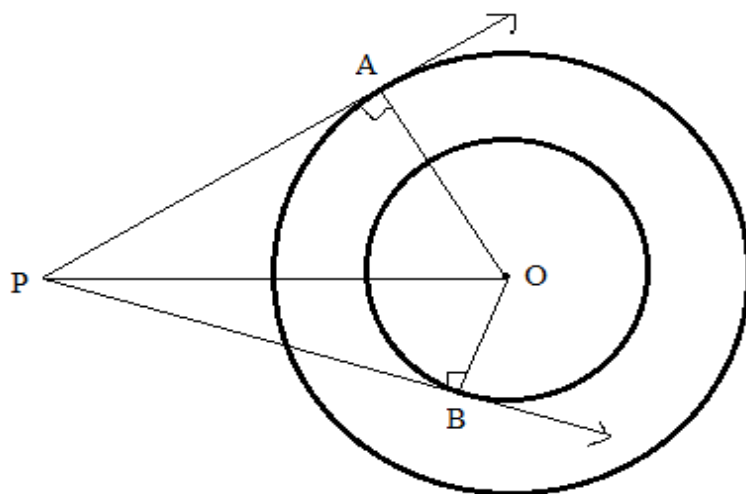
	Section A	
	Section A consists of 20 questions of 1 mark each.	
S.No		Marks
1	The perimeter of a triangle with vertices (0, 4), (0, 0) and (3, 0) is (a) 5 units (b) 12 units (c) 11 units (d) $(7 + \sqrt{5})$ units	1
2	The prime factors there in prime factorization of 5005 are (a) 5×1001 (b) $5 \times 7 \times 11 \times 17$ (c) $5 \times 11 \times 13 \times 17$ (d) $5 \times 7 \times 11 \times 13$	1
3	In triangle ABC, if DE is parallel to AB, AB = a units, DE = x units, BE = b units, CE = c units, then how must be x written in terms of a, b, and c a) $\frac{ac}{b}$ b) $\frac{ab}{c}$ c) $\frac{ac}{b+c}$ d) $\frac{ab}{b+c}$	1
4	A quadratic of polynomial, whose zeroes are -5 and 8 is (a) $x^2 + 3x - 40$ (b) $x^2 + 3x + 40$	1

	(c) $x^2 - 3x + 40$ (d) $x^2 - 3x - 40$	
5	The pair of equations $x = 2$ and $y = -3$ graphically represents the lines which are (a) Coincident (b) intersecting at $(2, -3)$ (c) parallel (d) intersecting at $(-3, 2)$	1
6	If the lines given by $2x + 3y = 9$ and $6x + (k-2)y = (3k - 2)$ are parallel, then the value of k is: a) 5 b) 6 c) 11 d) 12	1
7	In the figure, if PA and PB are tangents to the circle with centre O such that $\angle APB = 50^\circ$, then $\angle OAB$ is equal to  (a) 25° (b) 30° (c) 40° (d) 50°	1
8	In what ratio will the origin divide the join of the points whose coordinates are given by $(3,8)$ and $(-3,-8)$? (a) 1:1 (b) 1:2 (c) 2:1 (d) 1:4	1
9	Which of the following is true? (a) The value of $\tan A$ is always less than 1 (b) The value of $\cos A$ increases as A increases (c) $\sec A$ is not defined for 90 degree (d) $\sin A = \cos A$ is true for all values of A	1
10	An event is very unlikely to happen. Its probability is closest (a) 0.0001 (b) 0.0010 (c) 0.0100 (d) 0.1000	1
11	If the perimeters of a circle and a square are equal, then the ratio of area of circle to that of square is	1

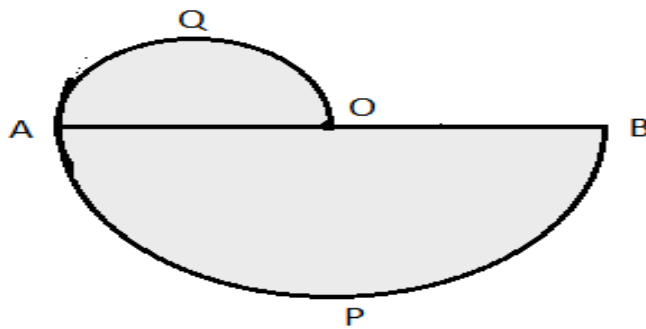
	(a) 22:7(b) 14:11 (c) 7:22(d) 11:14													
12	In Triangle, ABC, DE BC , the value of x will be  (a) 1 (b) 2 (c) 3 (d) 4	1												
13	There are 30 cards of the same size in a bag in which the numbers 1 to 30 are written. One card is taken out of the bag at random. What is the probability that the number on the selected card is an odd prime? (a) $\frac{4}{15}$(b) $\frac{3}{10}$(c) $\frac{1}{3}$(d) $\frac{2}{5}$	1												
14	Consider the following distribution <table border="1"><tr><td>Class</td><td>0-5</td><td>5-10</td><td>10-15</td><td>15-20</td><td>20-25</td></tr><tr><td>Frequency</td><td>10</td><td>15</td><td>12</td><td>20</td><td>9</td></tr></table> The sum of lower limits of the median class and the modal class is : (a)15 (b) 25 (c)30 (d)35	Class	0-5	5-10	10-15	15-20	20-25	Frequency	10	15	12	20	9	1
Class	0-5	5-10	10-15	15-20	20-25									
Frequency	10	15	12	20	9									
15	If $\sin A = x$ and $\sec A = y$, then $\cot A$ will be (a) $\frac{x}{y}$(b) $\frac{y}{x}$(c) $\frac{1}{xy}$(d) xy	1												
16	If the quadratic equation $x^2 + 4x + k = 0$ has real and equal roots, then (a) $k < 4$ (b) $k > 4$ (c) $k = 4$ (d) $k \geq 4$	1												
17	The perimeters of two similar triangles are 36 cm and 64 cm. The ratio of their corresponding sides will be	1												

	(a) 3:4 (b) 3:5 (c) 5:8 (d) 9:16	
18	If $\cos 5A = \frac{\sqrt{3}}{2}$, then the value of $\operatorname{cosec} 10A$ will be (a) $\sqrt{2}$ (b) 1 (c) $\frac{2}{\sqrt{3}}$ (d) not defined	1
19	Statement A (Assertion): Two cubes each of side 2 cm are joined end to end so as to form a cuboid. The volume of the cube is 8 cm^3 and volume of cuboid is 16 cm^3. Statement R(Reason) : If n cubes are joined end to end in a line to form a cuboid, the volume of cuboid will be n times the volume of a single cube. (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): A tangent to a circle is perpendicular to the radius through the point of contact. Statement R(Reason) : The perpendicular from centre of the circle bisects the chord. (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	
21	How many three-digit numbers are divisible by 9?	2

22	If α and β are zeroes of the polynomial $x^2 - x - 4$, then what is the value of $\frac{1}{\alpha} + \frac{1}{\beta} - \alpha\beta$ OR Find the zeroes of the quadratic polynomial $6x^2 - 3 - 7x$ and verify the relationship between the zeroes and the coefficients.	2
23	If $2 \sin A - \sqrt{3} = 0$, find the value of $5 \cot^2 A - 1$	2
24	In the figure, QR is common tangent to circles C1 and C2 touching externally at T. Find the length of QR if QP=3.2cm.  OR The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.	2
25	On GT road, three consecutive traffic lights change after 36, 42 and 72 seconds. If the lights are first switched on at 9:00:00 am, then at what time will the lights change simultaneously?	2
Section C		
26	Show that $\frac{\tan A}{\sec A - 1} + \frac{\tan A}{\sec A + 1} = 2 \operatorname{cosec} A$	3
27	In the figure there are two concentric circles of radii 4cm and 6cm, with centre O. If AP is a tangent to the larger circle and BP is a tangent to the smaller circle, and length of AP is 8cm, find the length of BP.	3



28	If $x = a$, $y = b$ is the solution of the pair of equation $x - y = 2$ and $x + y = 4$, then find the value of a and b. OR Write the equation of a line which is parallel to the line represented by the linear equation $2x + 3y = 6$. How many such equations are possible?	3
29	Two dice are thrown at the same time. What is the probability that the sum of the two numbers appearing on the top of the dice is (i) 8?(ii) an odd number less than 6 ? (iii) a number less than or equal to 12?	3
30	Prove that $\sqrt{3}$ is irrational.	3
31	A wire bent in the form of an equilateral triangle encloses an area of $121\sqrt{3} \text{ cm}^2$. If the same wire is bent in the form of a circle, what will be the radius of the circle? OR In the figure APB and AQO are semicircles and $OA = OB$. If the perimeter of the figure is 40 cm, find the area of the shaded portion.	3



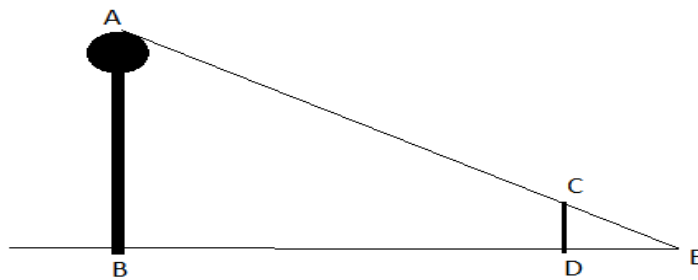
Section D

- 32** The area of a rectangle is 84 sq units and the longer side is 5 units more than the shorter side. Find the length of both sides

OR

Two water taps together can fill a tank in 6 hours. The tap with larger diameter takes 9 hours less than the smaller one to fill the tank completely. Find the time in which each tap can fill the tank separately.

- 33** A girl of height 90 cm is walking away from the base of a lamp post at the speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.



- 34** If the median of the following frequency distribution is 32.5, find the values of f_1 and f_2 .

Classes	0-10	10-20	20-30	30-40	40-50	50-60	60-70	total
Frequency	f_1	5	9	12	f_2	3	2	40

OR

If the mean of the following frequency distribution is 91, find the values of f_1 and f_2 .

Classes	0-30	30-60	60-90	90-120	120-150	150-180	total
Frequency	12	21	f_1	52	f_2	11	150

35

A hemispherical tank , full of water is emptied by a pipe at the rate of $\frac{25}{7}$ litres per second. How much time will it take to empty half the capacity of the tank if the base diameter of the tank is 3m.

5

Section E

36

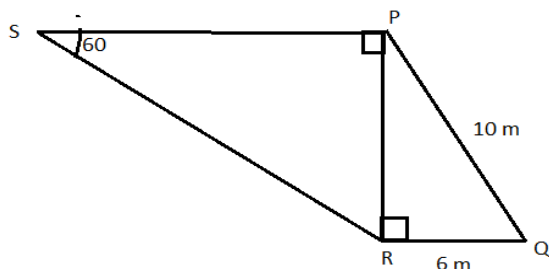
Your friend Veer wants to participate in a 200m race. He can currently run that distance in 51 seconds and with each day of practice it takes him 2 seconds less. He wants to do in 31 seconds.



i)	Write an AP for the given situation.	1
ii)	What is the minimum number of days he needs to practice till his goal is achieved?	1
iii)	Veer meets with a road accident and gets out of practice due to leg injuries. It takes him eight months to recover. He gradually picks up his practice, this time starting at 72 seconds for 200 m run. He is able to reduce his run time by 2 seconds with every three days of practice. Improving at the same rate, in how many days of continuous practice will he be able to run the distance in 30 seconds?	2
OR		
If he runs 1 km on first day of practice and keeps on running 500 m extra on each successive day, how much distance would he have run in first 10 days of practice.		

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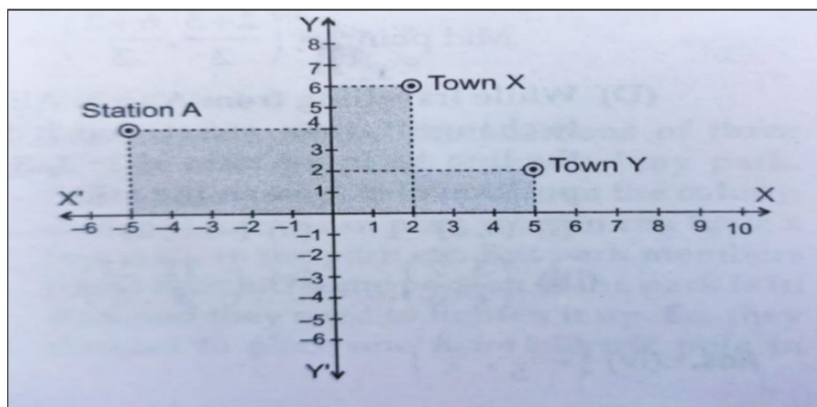
Janardhan acquired a piece of land in the shape of a quadrilateral. One day, he engaged with his fellow villagers to produce a rough sketch of his land. One of the men happened to be a draftsman and he technically guided then in the task. Following is the sketch they made.



i)	What is the value of $\tan Q$?	1
ii)	What is the value of RS ?	1
iii)	What is the value of $\sec Q (1 - \sin Q)$?	2
OR		
	What is the value of $\sin^2 S - \tan^2 S$?	

38

Two friends Rohan and Sagar work in the same office in Delhi. During the long weekend, they both decided to go to their respective home towns represented by Town X and Town Y. Town X and Town Y are connected by trains from the same station A in New Delhi. The position of Town X, Town Y and station A is shown on the coordinate plane.



i)	How far does Rohan have to travel from station A to town X?	1
ii)	How far does Sagar have to travel from station A to town Y?	1

	iii)	While travelling from A to Y, Sagar gets down at a station which is situated at a point which divides line AY in the ratio 2:3. What is the position of his stoppage point? OR Both of them plan to meet at a place exactly half way on the line joining towns X and Y. What are the coordinates of their meeting point?	2