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— SCHOOL SECTION —

CBSE CLASS 10 – MATHEMATICS Qs PAPER 2025_26

Series JMS/2

SET - 1

Code No. **2/4/20**

Roll No. | | | | | | | |

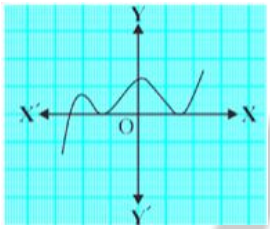
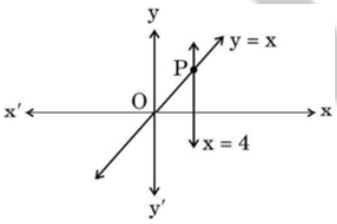
Candidates must write the Code on the title page of the answer-book

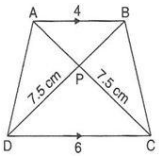
General Instructions:

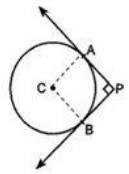
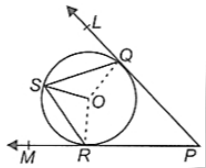
1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1 - 18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion - Reason based questions of 1 M each.
4. In Section B, Questions no. 21 - 25 are very short answer (VSA) type questions, carrying 02 marks each.
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 Questions of Section B, 2 Questions of Section C and 2 Questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take $\pi = 22/7$ wherever required if not stated.
11. Use of calculators is not allowed.

MATHEMATICS (041)

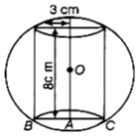
Time allowed : 3 hours *Maximum Marks : 80*

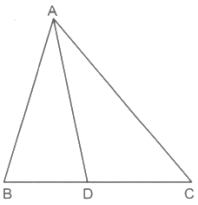
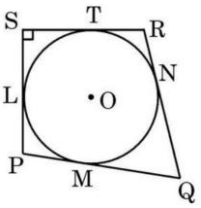
	Section A	
1	If $a = 2^3 \times 3, b = 2 \times 3 \times 5, c = 3^n \times 5$ and LCM (a, b, c) $= 2^3 \times 3^2 \times 5$, then n = a) 3 b) 4 c) 1 d) 2	**[1]**
2	The graph of y = p(x) in a figure given below, for some polynomial p(x). Find the number of zeroes of p(x).  a) 2 b) 3 c) 1 d) 4	**[1]**
3	The lines represented by the linear equations y =x and x= 4 intersectat P. The coordinates of the point P are:  a) (4, 4) b) (- 4, 4) c) (4, 0) d) (0, 4)	**[1]**
4	If x = 1 is a common root of $ax^2 + ax + 2 = 0$ and $x^2 + x + b = 0$ then, ab a) 2	**[1]**

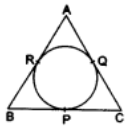
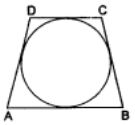
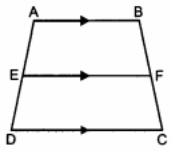
	b) 4 c) 1 d) 3	
5	How many three - digit numbers are divisible by 9? a) 86 b) 100 c) 96 d) 90	**[1]**
6	The distance between the points (3, 0) and (0, - 3) is a) 3 units b) 6 units c) $2\sqrt{3}$ units d) $3\sqrt{2}$ units	**[1]**
7	The coordinates of the point P dividing the line segment joining the points A (1, 3)and B(4, 6)in the ratio 2: 1 are a) (4, 2) b) (2, 4) c) (5, 3) d) (3, 5)	**[1]**
8	In the given figure,if AB||DC, then AP is equal to  a) 7 cm. b) 5 cm. c) 5.5 cm. d) 6 cm.	**[1]**

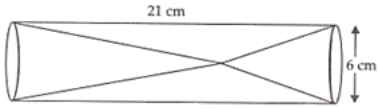
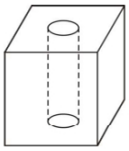
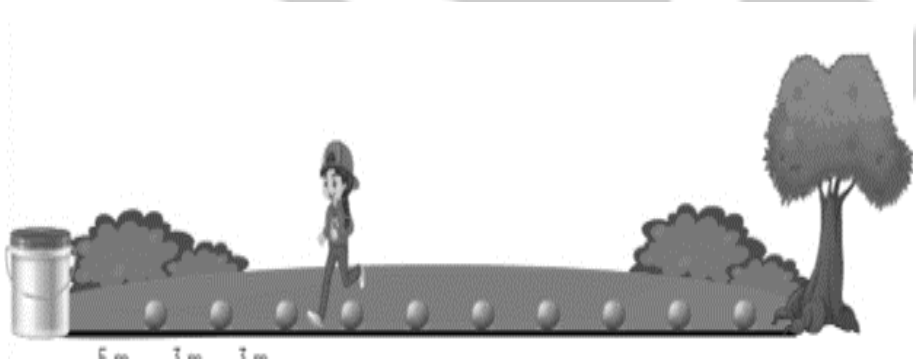
9	In the given figure, the pair of tangents A to a circle with centre O are perpendicular to each other and length of each tangent is 5 cm, then the radius of the circle is :  a) 7.5 cm b) 10 cm c) 2.5 cm d) 5 cm	**[1]**
10	In the given figure, O is the centre of a circle; PQL and PRM are the tangents at the points Q and R respectively and S is a point on the circle such that∠ SQL = 50 ^{o} and ∠ SRM = 60 ^{o} . Then, find ∠ QSR and ∠ RPQ respectively.  a) 60^o , 120 ^{o} b) 50^o , 140 ^{o} c) 70^o , 40 ^{o} d) 40^o , 140 ^{o}	**[1]**
11	Which of the following is a trigonometric identity? a) $\text{cosec}^2\theta + \cot^2\theta = 1$ b) $\sec^2\theta = 1 + \tan^2\theta$ c) $\sin 2\theta = 2\sin\theta$ d) $\sin^2\theta = 1 + \cos^2\theta$	**[1]**
12	3 cos^2 60 ^{o} + 2 cot ^{2} 30 ^{o} - 5 sin ^{2} 45 ^{o} = ? a) 1 b) 4 c) $\frac{13}{6}$	**[1]**

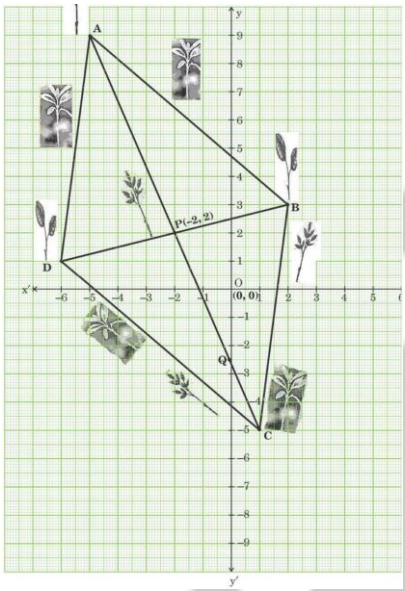
	d) $\frac{17}{4}$	
13	The tops of two poles of height 16 m and 10 m are connected by a wire. If the wire makes an angle of 30^o with the horizontal, then the length of the wire is a) 10 m b) $10\sqrt{3}$ m c) 16 m d) 12 m	**[1]**
14	If the perimeter of a sector of a circle of radius 5.2 cm is 16.4 cm, then the area of the sector is _____. a) 15.1 cm^2 b) 15.9 cm^2 c) 15.5 cm^2 d) 15.6 cm^2	**[1]**
15	If the area of a sector of a circle bounded by an arc of length 5π cm is equal to 20 π cm^2 , then find it's radius a) 16 cm b) 10 cm c) 12 cm d) 8 cm	**[1]**
16	One card is drawn at random from a well - shuffled deck of 52 cards. What is the probability of getting a 6? a) $\frac{1}{52}$ b) $\frac{3}{26}$ c) $\frac{1}{13}$ d) $\frac{4}{52}$	**[1]**
17	A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball, then the number of blue balls is a) 8 b) 12	**[1]**

	c) 10 d) 5	
18	The most frequent value in the data is known as a) all the three b) median c) mode d) mean	**[1]**
19	**Assertion (A):** In the given figure, a sphere circumscribes a right cylinder whose height is 8 cm and radius of the base is 3 cm. The ratio of the surface area of the sphere and the cylinder is 6: 11  **Reason (R):** Ratio of their surface area = $\frac{Surface\ area\ of\ sphere}{Surface\ area\ of\ cylinder}$ 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.	**[1]**
20	**Assertion (A):** Arithmetic mean between 8 and 12 is 10. **Reason (R):** Arithmetic mean between two numbers aand bis given as $\frac{a+b}{2}$. 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.	**[1]**
	Section B	
21	Prove that$\frac{1}{\sqrt{5}}$ is an irrational number. **OR** Find the HCF and LCM of 90 and 144 by the method of prime factorization.	**[2]**

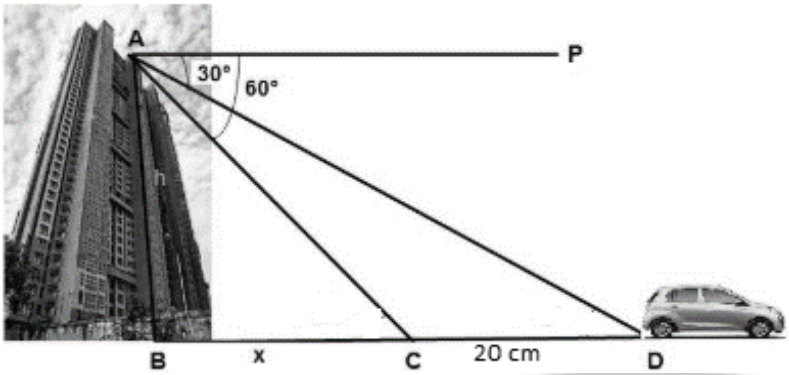
22	In Fig. check whether AD is the bisector of$\angle A$ of $\triangle ABC$ ifAB = 8 cm, AC = 24 cm, BD = 6 cm and BC = 24 cm  	**[2]**
23	In the given figure, PQRS is a quadrilateral such that$\angle S = 90°$. A circle with centre 'O' is inscribed in the quadrilateral. The circle touches PQ, QR, RS and SP at points M, N, T and L respectively. If $= 19\ cm$, $RQ = 30\ cm$ and $SR = 21\ cm$, then find the radius of the circle.  	**[2]**
24	Evaluate 4 ($\sin^4 30° + \cos^4 60°$) - $\frac{2}{3}$ ($\sin^2 60° - \cos^2 45°$) + $\frac{1}{2}\tan^2 60°$. **OR** If$\tan A = \sqrt{3}$; where A is an acute angle, then find the value of $\frac{\sin^2 A}{1+\cos^2 A}$.	**[2]**
25	A chord of a circle of radius 14 cm makes a right angle at the centre. Find the areas of the minor and the major segments of the circle.	**[2]**
	Section C	
26	On morning walk, three persons step offtogether and their steps measure 40 cm, 42 cm and 45 cm, respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps?	**[3]**
27	Find the zeroes ofquadratic polynomial$x^2 - 2x - 8$and verify the relationship between the zeroes and theircoefficients.	**[3]**
28	Following frequency distribution shows the ages of girls of a city at the time of their marriage. If modal age of the data is 24 years, find the missing frequency 'x '. **Age (in years):** $18-23$ | $23-28$ | $28-33$ | $33-38$ | $38-43$ | 43 - **Number of girls:** 160 | 170 | x | 50 | 38 | 10	**[3]**
29	Use elimination method to find all possible solutions of the following pair of linear equations ax + by - a + b = 0 and bx - ay - a - b = 0	**[3]**

	OR If we buy 2 tickets from station A to station B, and 3 from station A to station C, we have to pay Rs. 795. But 3 tickets from station A to B and 5 tickets from A to C cost a total of Rs. 1300. what is the fare from station A to B and that from station A to C ?	
30	Prove that: $$\frac{1}{\cot^2 A} + \frac{1}{1+\tan^2 A} = \frac{1}{1-\sin^2 A} - \frac{1}{\text{cosec}^2 A}$$	**[3]**
31	In the given figure, the incircle - of$\triangle ABC$ touches the sides BC, CA and AB at P, Q and R respectively. Prove that (AR + BP + CQ) = (AQ + BR + CP) = $\frac{1}{2}(perimeter of \Delta ABC)$.  **OR** In Figure, a circle touches all the four sides of a quadrilateral ABCD withAB = 6 cm, BC = 7 cm and CD = 4 cm. Find AD.  	**[3]**
	Section D	
32	Calculate the median from the following frequency distribution: **Class** | 5 - 10 | 10 - 15 | 15 - 20 | 20 - 25 | 25 - 30 | 30 - 35 | 35 - 40 | 40 - 45 **Frequency** | 5 | 6 | 15 | 10 | 5 | 4 | 2 | 2	**[5]**
33	If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio, Prove it. Use this result to prove the following: In the given figure, if ABCD is a trapezium in which AB || DC || EF, then $\frac{\mathbf{AE}}{\mathbf{ED}} = \frac{\mathbf{BF}}{\mathbf{FC}}$  	**[5]**
34	The sum of ages of a father and his son is 45 years. Five years ago, the product of their ages (in years) was 124. Determine their present ages.	**[5]**

	OR Find the smallest value of p for which the quadratic equation$x^2 - 2(p+1)x + p^2 = 0$ has real roots. Hence, find the roots of the equation so obtained.	
35	Two solid cones A and B placed in a cylindrical tube as shown in the figure. The ratio of their capacities are2 : 1. Find the heights and capacities of cones. Also, find the volume of the remaining portion of the cylinder.  **OR** In Figure, from a solid cube of side 7 cm, a cylinder of radius 2.1 cm and height 7 cm is scooped out. Find the total surface area of the remaining solid. 	**[5]**
	Section E	
36	**Read the following text carefully and answer the questions that follow:** In a potato race, a bucket is placed at the starting point, which is 5 m from the first potato, and the other potatoes are placed 3 m apart in a straight line. There are ten potatoes in the line. A competitor starts from the bucket, picks up the nearest potato, runs back with it, drops it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it in, and she continues in the same way until all the potatoes are in the bucket. What is the total distance the competitor has to run?  1. Find the terms of AP formed in above situation. (1) 2. What is the total distance the competitor has to run? (1) 3. Find distance cover after 4 potato drop in the bucket? (2) **OR**	**[4]**

	Find the distance covered by competitor in order to put 5 th potato in the bucket. (2)	
37	Trees act the natural filters. By planting trees in and around school premises, we create cleaner and healthier air for students and local residents, reducing respiratory problems. A school in Noida has proposed and organised a community drive on tree plantation under the title "Save Earth, Plant Trees". Students of that school have planted saplings in the field such that it formed a quadrilateral as shown in the figure$ABCD$.  Based on the information given above, answer the following questions: 1. Find the distance between the two saplings at A and D. **(1)** 2. a. One student plants one sapling at the mid - point of AD. Then he moves along a straight line parallel to DB and sows another sapling on AB. What are the coordinates of the positions of these two new saplings? **(2)** **OR** b. A new sapling is kept at a point M on DB such that$DM : MB = 3 : 1$. Find the coordinates of M. **(2)** 3. The line segments AC and BD bisect each other at$P(-2,2)$. Find the coordinates of C. **(1)**	**[4]**
38	**Read the following text carefully and answer the questions that follow:** Vijay lives in a flatina multi - story building. Initially, his driving was rough so his father keeps eye on his driving. Once he drivesfrom his house to Faridabad. His father was standing on the top of the building at point A as shown in the figure. At point C, the angle of depression of a car from the building was 60 ^{o} . After	**[4]**

accelerating 20 m from point C, Vijay stops at point D to buy ice cream andthe angle of depression changed to 30 ^{o} .



1. Find the value of x. (1)
2. Find the height of the building AB. (1)
3. Find the distance between top of the building and a car at position D? (2)

OR

Find the distance between top of the building and a car at position C? (2)

ALL THE BEST