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SAMPLE PAPER TEST 01 FOR BOARD EXAM 2026

SUBJECT: MATHEMATICS **MAX. MARKS : 80**
CLASS : X **DURATION : 3 HRS**

General Instruction:

1. This Question Paper has 5 Sections A-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 π =22/7 wherever required if not stated.

SECTION – A
Questions 1 to 20 carry 1 mark each.

1. If a, b are zeroes of the polynomial $x^2 - 1$, then value of (a + b) is:
(a) 2 (b) 1 (c) – 1 (d) 0

2. If x tan 60°cos 60°= sin60°cot 60°, then x =
(a) cos30° (b) tan30° (c) sin30° (d) cot30°

3. If two positive integers p and q can be expressed as $p = 18\ a^2b^4$ and $q = 20\ a^3b^2$, where a and b are prime numbers, then LCM (p, q) is :
(a) $2\ a^2b^2$ (b) $180a^2b^2$ (c) $12\ a^2b^2$ (d) $180\ a^3b^4$

4. If the quadratic equation $ax^2 + bx + c = 0$ has two real and equal roots, then 'c' is equal to
(a) $-b/2a$ (b) $b/2a$ (c) $-b^2/4a$ (d) $b^2/4a$

5. The centre of a circle is at (2, 0). If one end of a diameter is at (6, 0), then the other end is at :
(a) (0, 0) (b) (4, 0) (c) (-2, 0) (d) (-6, 0)

6. The pair of linear equations 2x = 5y + 6 and 15y = 6x – 18 represents two lines which are:
(a) intersecting (b) parallel (c) coincident (d) either intersecting or parallel

7. sec θ when expressed in terms of cot θ, is equal to:
(a) $\frac{1+\cot^2\theta}{\cot\theta}$ (b) $\sqrt{1+\cot^2\theta}$ (c) $\frac{\sqrt{1+\cot^2\theta}}{\cot\theta}$ (d) $\frac{\sqrt{1-\cot^2\theta}}{\cot\theta}$

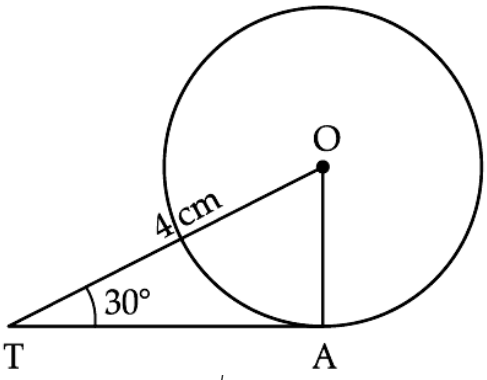
8. If ΔPQR ~ ΔABC; PQ = 6 cm, AB = 8 cm and the perimeter of ΔABC is 36 cm, then the perimeter of ΔPQR is
(a) 20.25 cm (b) 27 cm (c) 48 cm (d) 64 cm

9. What is the area of a semi-circle of diameter 'd' ?
(a) $\frac{1}{16}\pi d^2$ (b) $\frac{1}{4}\pi d^2$ (c) $\frac{1}{8}\pi d^2$ (d) $\frac{1}{2}\pi d^2$

10. $\Delta ABC \sim \Delta PQR$. If AM and PN are altitudes of ΔABC and ΔPQR respectively and $AB^2 : PQ^2 = 4 : 9$, then AM : PN =

(a) 3 : 2 (b) 16 : 81 (c) 4 : 9 (d) 2 : 3

11. In the given figure, TA is a tangent to the circle with centre O such that OT = 4 cm, $\angle OTA = 30°$, then length of TA is:



(a) $2\sqrt{3}$ cm (b) 2 cm (c) $2\sqrt{2}$ cm (d) 3 cm

12. The volume of a right circular cone whose area of the base is 156 cm^2 and the vertical height is 8 cm, is:

(a) 2496 cm^3 (b) 1248 cm^3 (c) 1664 cm^3 (d) 416 cm^3

13. For some data $x_1, x_2, \ldots\ldots x_n$ with respective frequencies $f_1, f_2, \ldots\ldots f_n$, the value of $\sum_1^n f_i(x_i - \bar{x})$ is equal to:

(a) $n\bar{x}$ (b) 1 (c) $\sum f_i$ (d) 0

14. A bag contains 5 pink, 8 blue and 7 yellow balls. One ball is drawn at random from the bag. What is the probability of getting neither a blue nor a pink ball ?

(a) 1/4 (b) 2/5 (c) 7/20 (d) 13/20

15. If $\cos(\alpha + \beta) = 0$, then value of $\cos\left(\frac{\alpha+\beta}{2}\right)$ is equal to:

(a) $\frac{1}{\sqrt{2}}$ (b) $\frac{1}{2}$ (c) 0 (d) $\sqrt{2}$

16. ABCD is a trapezium with AD ‖ BC and AD = 4cm. If the diagonals AC and BD intersect each other at O such that AO/OC = DO/OB =1/2, then BC =

(a) 6cm (b) 7cm (c) 8cm (d) 9cm

17. The area of the circle that can be inscribed in a square of 6cm is

(a) 36π cm^2 (b) 18π cm^2 (c) 12π cm^2 (d) 9π cm^2

18. The middle most observation of every data arranged in order is called

(a) mode (b) median (c) mean (d) deviation

DIRECTION: In the question number 19 and 20, a statement of **Assertion (A)** is followed by a statement of **Reason (R)**.

Choose the correct option

(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.

19. Assertion (A): If product of two numbers is 5780 and their HCF is 17, then their LCM is 340
Reason (R): HCF is always a factor of LCM

20. Assertion (A): If the co-ordinates of the mid-points of the sides AB and AC of ΔABC are D(3,5) and E(-3,-3) respectively, then BC = 20 units
Reason (R): The line joining the mid points of two sides of a triangle is parallel to the third side and equal to half of it.

SECTION – B

Questions 21 to 25 carry 2 marks each.

21. Evaluate: $2\sqrt{2}\cos 45^0 \sin 30^0 + 2\sqrt{3}\cos 30^0$

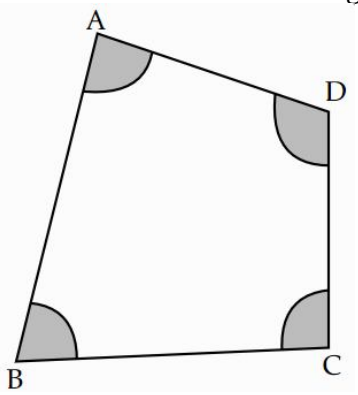
OR

If $A = 60^0$ and $B = 30^0$, verify that: $\sin(A + B) = \sin A \cos B + \cos A \sin B$

22. The length of the minute hand of a clock is 6cm. Find the area swept by it when it moves from 7:05 p.m. to 7:40 p.m.

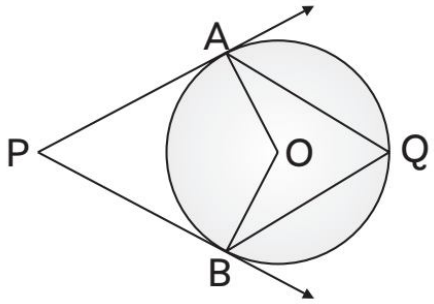
OR

In the given figure, arcs have been drawn of radius 7cm each with vertices A, B, C and D of quadrilateral ABCD as centres. Find the area of the shaded region.

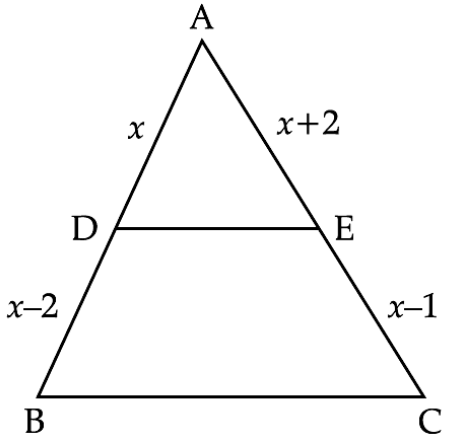


23. Solve the following system of linear equations: $7x - 2y = 5$ and $8x + 7y = 15$ and verify your answer.

24. In the given figure, O is the centre of circle. Find ∠AQB, given that PA and PB are tangents to the circle and ∠APB = 75°.



25. In the given figure, ABC is a triangle in which DE||BC. If AD = x, DB = x – 2, AE = x + 2 and EC = x – 1, then find the value of x.



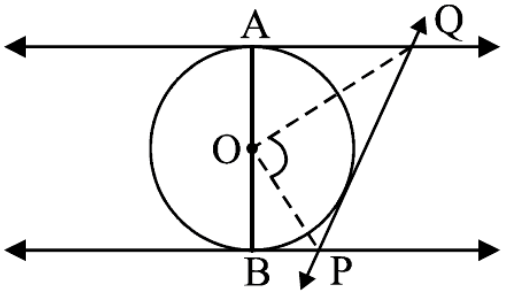
SECTION – C

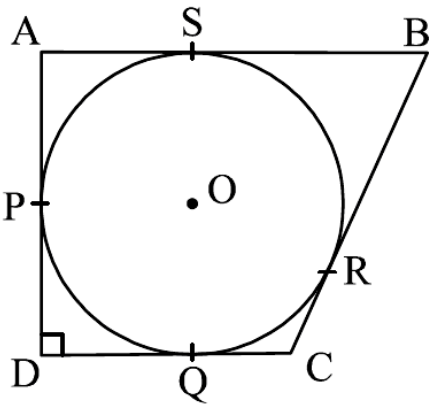
Questions 13 to 22 carry 3 marks each.

26. Prove that $\sqrt{5}$ is an irrational number.

27. Prove that: $\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}=1+\sec\theta\cos ec\theta$

28. In the given below left figure, AB is a diameter of the circle with centre O. AQ, BP and PQ are tangents to the circle. Prove that $\angle POQ = 90^0$.





OR

A circle with centre O and radius 8 cm is inscribed in a quadrilateral ABCD in which P, Q, R, S are the points of contact as shown in above right sided figure. If AD is perpendicular to DC, BC = 30 cm and BS = 24 cm, then find the length DC.

29. Two coins are tossed simultaneously. What is the probability of getting
(i) At least one head? (ii) At most one tail? (iii) A head and a tail?

30. If the zeroes of the polynomial $x^2 + px + q$ are double in value to the zeroes of the polynomial $2x^2 – 5x – 3$, then find the values of p and q.

31. Three years ago, Rashmi was thrice as old as Nazma. Ten years later, Rashmi will be twice as old as Nazma. How old are Rashmi and Nazma now?

OR

Anuj had some chocolates, and he divided them into two lots A and B. He sold the first lot at the rate of ₹2 for 3 chocolates and the second lot at the rate of ₹1 per chocolate, and got a total of ₹400. If he had sold the first lot at the rate of ₹1 per chocolate, and the second lot at the rate of ₹4 for 5 chocolates, his total collection would have been ₹460. Find the total number of chocolates he had.

SECTION – D

Questions 32 to 35 carry 5 marks each.

32. A student was asked to make a model shaped like a cylinder with two cones attached to its ends by using a thin aluminium sheet. The diameter of the model is 3 cm and its total length is 12 cm. If each cone has a height of 2 cm, find the volume of air contained in the model.

OR

There are two identical solid cubical boxes of side 7cm. From the top face of the first cube a hemisphere of diameter equal to the side of the cube is scooped out. This hemisphere is inverted and placed on the top of the second cube's surface to form a dome. Find (i) the ratio of the total surface area of the two new solids formed (ii) volume of each new solid formed.

33. To fill a swimming pool two pipes are used. If the pipe of larger diameter used for 4 hours and the pipe of smaller diameter for 9 hours, only half of the pool can be filled. Find, how long it would take for each pipe to fill the pool separately, if the pipe of smaller diameter takes 10 hours more than the pipe of larger diameter to fill the pool?

OR

In a flight of 600km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/hr from its usual speed and the time of the flight increased by 30 min. Find the scheduled duration of the flight.

34. If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then prove that the other two sides are divided in the same ratio.

35. The median of the following data is 525. Find the values of x and y, if the total frequency is 100

Class	Frequency
0-100	2
100-200	5
200-300	x
300-400	12
400-500	17
500-600	20
600-700	y
700-800	9
800-900	7
900-1000	4

SECTION – E(Case Study Based Questions)

Questions 36 to 38 carry 4 marks each.

36. The school auditorium was to be constructed to accommodate at least 1500 people. The chairs are to be placed in concentric circular arrangement in such a way that each succeeding circular row has 10 seats more than the previous one.

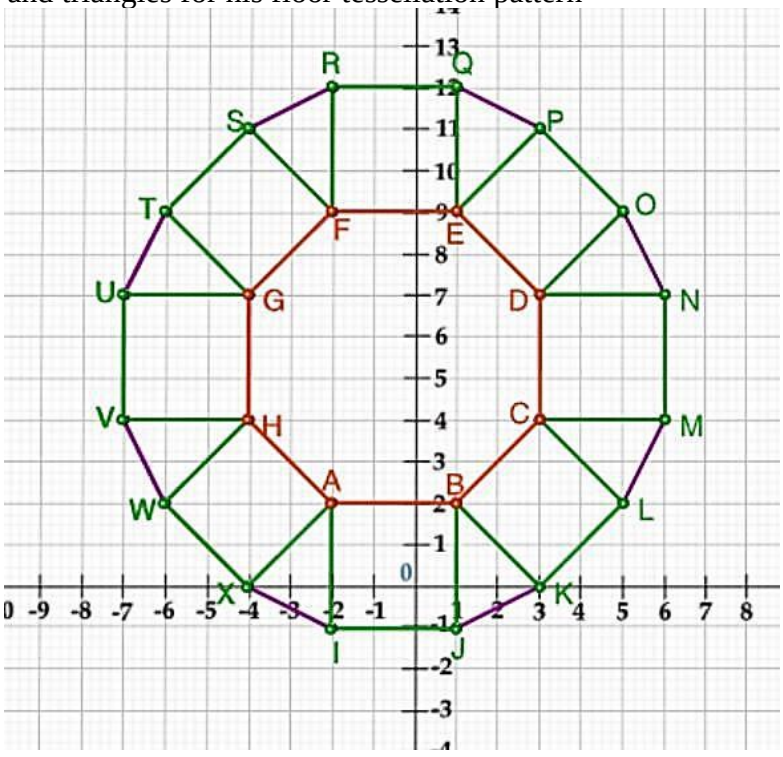
(i) If the first circular row has 30 seats, how many seats will be there in the 10th row?
(ii) For 1500 seats in the auditorium, how many rows need to be there?

OR

If 1500 seats are to be arranged in the auditorium, how many seats are still left to be put after 10th row?
(iii) If there were 17 rows in the auditorium, how many seats will be there in the middle row?

37. A tiling or tessellation of a flat surface is the covering of a plane using one or more geometric shapes, called tiles, with no overlaps and no gaps. Historically, tessellations were used in ancient Rome and in Islamic art. You may find tessellation patterns on floors, walls, paintings etc. Shown below is a tiled floor in the archaeological Museum of Seville, made using squares, triangles and hexagons.

A craftsman thought of making a floor pattern after being inspired by the above design. To ensure accuracy in his work, he made the pattern on the Cartesian plane. He used regular octagons, squares and triangles for his floor tessellation pattern



Use the above figure to answer the questions that follow:

(i) What is the length of the line segment joining points B and F?

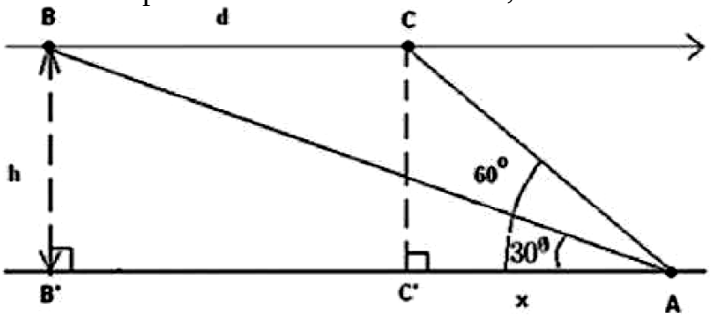
(ii) The centre 'Z'of the figure will be the point of intersection of the diagonals of quadrilateral WXOP. Then what are the coordinates of Z?

(iii) What are the coordinates of the point on y axis equidistant from A and G?

OR

What is the area of Trapezium AFGH?

38. Aditya is a pilot in Air India. During the Covid-19 pandemic, many Indian passengers were stuck at Dubai Airport. The government of India sent special aircraft to take them. Mr. Vinod was leading this operation. He is flying from Dubai to New Delhi with these passengers. His airplane is approaching point A along a straight line and at a constant altitude h. At 10:00 am, the angle of elevation of the airplane is 30° and at 10:01 am, it is 60°.



(i) What is the distance d is covered by the airplane from 10:00 am to 10:01 am if the speed of the airplane is constant and equal to 600 miles/hour?

(ii) What is the altitude h of the airplane? (round answer to 2 decimal places)

OR

Find the distance between passenger and airplane when the angle of elevation is 60°.

(iii) Find the distance between passenger and airplane when the angle of elevation is 30°.