BRIGHT RIDERS SCHOOL, ABU DHABI
PRE-BOARD EXAMINATION (2025-26)
CLASS: X

DATE: 17-11-2025 **MAX. MARKS: 80**

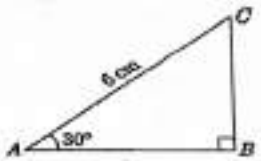
SUBJECT: MATHEMATICS **TIME ALLOWED: 3 HRS.**

General Instructions:

1. **Please check that this question paper contains 7 printed pages.**
2. **The question paper has 5 Sections A-E.**
3. **Section – A has 20 MCQs carrying 1 mark each.**
4. **Section – B has 5 questions carrying 02 marks each.**
5. **Section – C has 6 questions carrying 03 marks each.**
6. **Section – D has 4 questions carrying 05 marks each.**
7. **Section – E has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.**
8. **All questions are compulsory. However, an internal choice in 2 questions of 2 marks, 2 questions of 3 marks, 2 questions of 5 marks has been provided. An internal choice has been provided in the 2 marks questions of Section -E.**
9. **Draw neat figures wherever required. Take $\pi = \frac{22}{7}$, wherever required if not stated.**

SECTION – A **(1M X 20 = 20M)**

1. In the adjoining figure, the length of BC is:



(A) $2\sqrt{3}$ cm (B) $3\sqrt{3}$ cm (C) $4\sqrt{3}$ cm (D) 3 cm

2. In a frequency distribution, the mid value of a class is 10 and the width of the class is 6. The lower limit of the class is:

(A) 6 (B) 7 (C) 9 (D) 12

3. A solid ball is exactly fitted inside the cubical box of side a. The volume of the ball is:

(A) $\frac{1}{6}\pi a^3$ (B) $\frac{4}{3}\pi a^3$ (C) $\frac{1}{3}\pi a^3$ (D)none

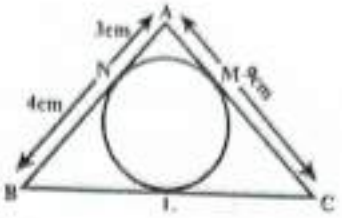
4. The line segment joining the points P(-3, 2) and Q(5, 7) is divided by the y-axis in the ratio:

(A) 3:1 (B) 5:3 (C) 3:2 (D) 3:5

5. 2000 tickets of a lottery were sold and there are 16 prizes on these tickets. Abhinav has purchased one lottery ticket. The probability that Abhinav wins a prize is:

(A) 10.08 (B) 00.07 (C) 0.008 (D) 0.080

6.In figure, ΔABC is circumscribing a circle. AN = 3 cm, BN = 4 cm and AC = 9 cm. Find the length of BC.



(A) 5 cm (B) 9 cm (C) 13 cm (D) 10 cm

7.A pole 'k' m high casts a shadow $2\sqrt{3}$ m long on the ground when the Sun's elevation is 60^0. Find the value of k.

(A) $6\sqrt{3}$ m (B) $9\sqrt{3}$ m (C) 6m (D) 9m

8.The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 15 minutes.

(A) 154 cm^2 (B) 145 cm^2 (C) 158 cm^2 (D) 148 cm^2

9.Two APs have the same common difference. The difference between their 7th terms is 17, if the 100th term of one of the AP is 37, what is the 100th term of the other AP?

(A) 20 or 54 (B) 117 or 83 (C) 63 or 54 (D) 137 or 107

10. The pair of linear equations $2x + 3y = 5$ and $4x + 6y = 10$ is:

(A) Inconsistent (B) consistent (C) dependent consistent (D) none

11. If p and q are the zeroes of the quadratic polynomial $f(x) = 2x^2 - 7x + 3$, find the value of $p + q - pq$ is:

(A) 1 (B) 2 (C) 3 (D) None

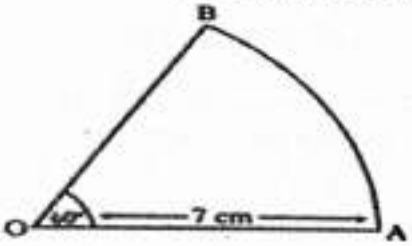
12. Values of 'k' for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is:

(A) 0 only (B) 4 (C) 8 only (D) 0, 8

13. In a right triangle ABC, right-angled at B, if tan A = 1, then 2 sin A cos A =?

(A) 1 (B) 0 (C) 2 (D) 3

14. The perimeter of the sector OAB shown in the figure ($\angle BOA = 60^0$), is:



(A) $\frac{64}{3}$cm (B) 26 cm (C) $\frac{22}{3}$ cm (D) 19cm

15. The value of 'k' for which the system of equations $2x + 3y = 5$, $4x + ky = 10$ has infinitely number of solutions, is:

(A) 1 (B) 6 (C) 3 (D) 0

16. The coordinates of a point A, where AB is the diameter of circle whose center is O(2,-3) and B(1, 4).

(A) $(\frac{3}{2}, \frac{1}{2})$ (B) $(\frac{1}{2}, \frac{-7}{2})$ (C) $(\frac{1}{2}, \frac{1}{2})$ (D) $(\frac{6}{2}, \frac{-20}{2})$

17. If the difference between the circumference and radius of a circle is 37 cm, then using $\pi = 22/7$ the circumference (in cm) of the circle is:

(A) 154 (B) 44 (C) 14 (D) 7

18. If the radii of the bases of a cylinder and a cone are in the ratio 3 : 4 and their heights are in the ratio 2 : 3 then the ratio between the volume of the cylinder to that of the cone is:

(A) 7 : 5 (B) 5 : 7 (C) 8 : 9 (D) 9 : 8

Direction: In question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.

19. Statement A (Assertion): The HCF of two numbers is 9 and their LCM is 2016. If one of the numbers is 306, then the other is 54.

Statement R (Reason): For any positive integers a and b, we have: Product of two numbers = HCF x LCM.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true and (R) is not the correct explanation of (A).
(C) Assertion (A) is true but (R) is false.
(D) Assertion (A) is false but (R) is true.

20. Statement A (Assertion): The value of $\sin\theta = \frac{4}{3}$ is not possible.

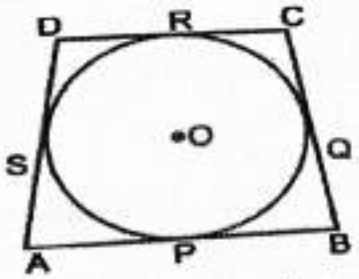
Statement R (Reason): Hypotenuse is the largest side in any right angled triangle.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true and (R) is not the correct explanation of (A).
(C) Assertion (A) is true but reason (R) is false.
(D) Assertion (A) is false but reason (R) is true.

SECTION – B

(2M X 5 = 10M)

21. In figure, a quadrilateral ABCD is drawn to circumscribe a circle, with centre O, in such a way that the sides AB, BC, CD and DA touch the circle at the points P, Q, R and S respectively. Prove that: AB + CD = BC + DA.



22. Find the zeroes of the quadratic equation $x^2 - 2x - 8 = 0$.

23. Prove that: $\frac{1-\cos A}{1+\cos A} = (\cot A - \operatorname{cosec} A)^2$

24. If α and β are roots of the quadratic equation $x^2 + \sqrt{2}x + 3 = 0$, find the quadratic equation whose roots are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$.

(OR)

Three bells tolls at the intervals of 9, 12, 15 minutes respectively. If they start tolling together after what time will they next toll together?

25. In a circle of radius 21 cm, an arc subtends an angle of 60° at the center. Find (i) the length of the arc (ii) area of the sector formed by the arc. (Use $\pi = 22/7$)

(OR)

Find the radius of a circle whose circumference is equal to the sum of the circumferences of two circles of radii 15 cm and 18 cm.

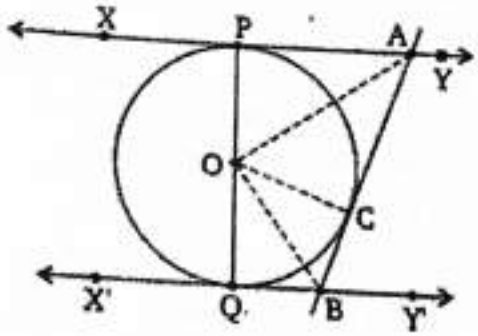
SECTION – C **(3M X 6 = 18M)**

26. If 2 is added to the numerator of a fraction, it reduces to $\frac{1}{2}$ and if 1 is subtracted from the denominator, it reduces to $\frac{1}{3}$. Find the fraction.

(OR)

The sum of a two-digit number and the number obtained by reversing the order of its digits is 99. If the digits differ by 3, find the number.

27. In the figure, XY and X'Y' are two parallel tangents to a circle, x with centre O and another tangent AB with a point of contact C intersecting XY at A and X'Y' at B. Prove that $\angle AOB = 90°$.



28. Prove that: $\frac{tan\theta + sec\theta - 1}{tan\theta - sec\theta + 1} = \frac{1 + sin\theta}{cos\theta}$.

(OR)

Prove that: $\frac{cosA}{1+sinA} + \frac{1+sinA}{cosA} = 2secA$.

29. Find the zeroes of the quadratic polynomial $x^2 - 2x - 8$ and verify the relationship between the zeroes and their coefficients.

30. Prove that $\sqrt{3}$ is an irrational number hence $3\sqrt{3} - 7$ also irrational number.

31. A 1.2 m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2 m from the ground. The angle of elevation of the balloon from the eyes of the girl at any instant is 60°. After some time, the angle of elevation reduces to 30° (see Fig). Find the distance travelled by the balloon during the interval.

SECTION – D

(5M X 4 = 20M)

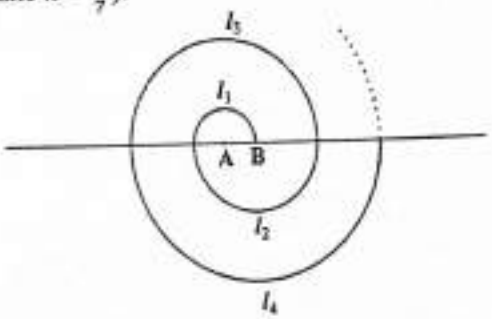
32. (a) A sum of 700 is to be used to give seven cash prizes to students of a school for their overall academic performance. If each prize is 20 less than its preceding prize, find the value of each of the prizes.

(b) Find the sum of first 51 terms of an AP whose second and third terms are 14 and 18 respectively.

(OR)

(a) If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first n terms.

(b) A spiral is made up of successive semicircles, with centres alternately at A and B, starting with centre at A, of radii 0.5 cm, 1.0 cm, 1.5 cm, 2.0 cm, . . . as shown in Fig. What is the total length of such a spiral made up of thirteen consecutive Semicircles? (Take $\pi = \frac{22}{7}$).



33. A circus tent is in the shape of a cylinder surmounted by a conical top of the same diameter. If their common diameter is 56m, the height of cylindrical part is 6m and the total height of the tent above the ground is 27m, find the area of canvas used in making the tent.

34. The marks of 80 students of class X in Mathematics test are given below. Find the mode of these marks obtained by the students in the Mathematics test.

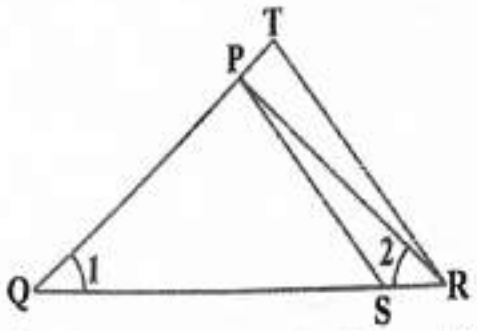
Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Total
Frequency	2	6	12	16	13	20	5	1	4	1	80

(OR)

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

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

35. (a) In Fig. , $\frac{QR}{QS} = \frac{QT}{PR}$ and $\angle 1 = \angle 2$. Show that $\Delta PQS \sim \Delta TQR$.



(b) A vertical pole of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower.

SECTION – E **(4M X 3 = 12M)**

Case study based questions are compulsory.

36. Two friends Raj and Anuj have to travel to Shimla via Chandigarh from Gurgaon. When they reached the bus stand of Gurgaon, Raj got a call from his friend Ankit who was also on his way to the bus stand. Ankit requested Raj to buy two tickets to Chandigarh and 3 tickets to Shimla also Anuj's friend Kamla asked Anuj to buy 3 tickets to Chandigarh and 4 tickets to Shimla. Raj purchased 2 tickets to Chandigarh and 3 tickets to Shimla for Rs. 3700, Anuj spent Rs. 5100 to buy 3 tickets to Chandigarh and 4 tickets to Shimla. Based on the above information answer the following questions.

(i) If cost of one ticket to Chandigarh is Rs. x and cost of one ticket to Shimla is Rs. y then represent the situation algebraically. (1)

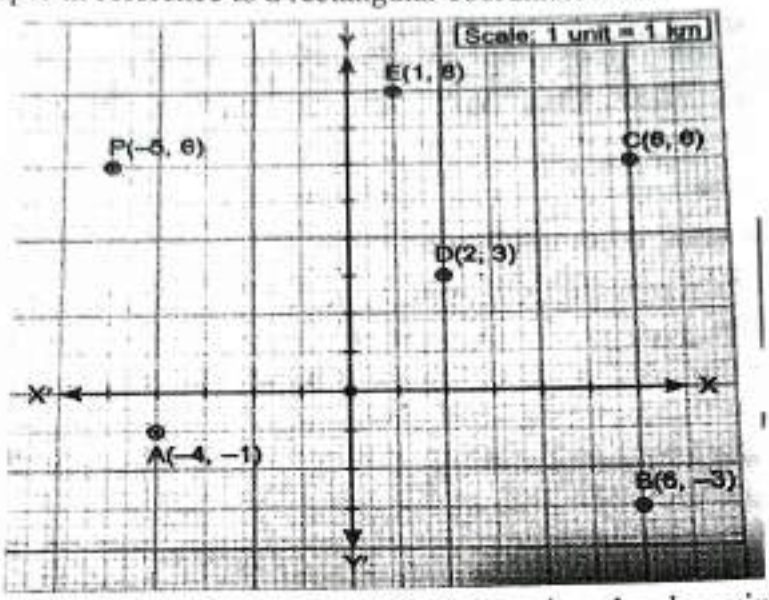
(ii) Find the cost of one ticket from Gurgaon to Chandigarh. (1)

(iii) If Raj purchases 3 tickets to Chandigarh and 5 tickets to Shimla, how much will he pay? (2)

(OR)

(iii) If Anuj spends Rs. 5600 to buy tickets, find how many total number of tickets he purchased. (2)

37. Five ships are positioned in the Indian Ocean. Their positions were plotted on graph paper in reference to a rectangular coordinate axes.



An enemy ship is spotted at P(-5 6). Based on the above information answer the following questions.

(i) What is the distance between P and E? (1)

(ii) Find the coordinate of the midpoint of BD. (1)

(iii) Ship D is moved to a position which is the midpoint of AE. Find the distance moved by D. (2)

(OR)

(iii) We find a rock at new position G such that B, G and C are in a straight line and BG: GC = 3:1 then find the coordinates of G. (2)

38. Group of friends playing with cards bearing numbers 5 to 50. All cards are placed in a box and are mixed thoroughly. One friend withdraws the card from the box at random and then replaces it.

Based on the above information answer the following questions.

(i) What is the probability that the card withdrawn from the box bears a prime number less than 10? (1)

(ii) What is the probability that the card withdrawn from the box bears a number which is a perfect square? (1)

(iii) What is the probability that the card withdrawn from the box bears a number which is multiple of 7 between 40 and 50? (2)

(OR)

(iii) Find the probability of drawing a card bearing number from 5 and 50. (2)