

# Kerala Board Class 10 Mathematics Question Paper

|                                 |                   |                     |
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| Time Allowed :2 Hour 30 Minutes | Maximum Marks :80 | Total Questions :27 |
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## General Instructions

Read the following instructions very carefully and strictly follow them:

1. There are 27 questions, split into five Sections A, B, C, D, E.
2. Answer all questions, but in questions of type A or B, you need to answer only one of those.
3. You can answer the questions in any order, write the correct question number.
4. Trigonometric tables are given at the end and can be used wherever necessary.
5. Answer must be explained, wherever necessary.
6. No need to simplify irrationals like  $\sqrt{2}$ ,  $\sqrt{3}$ , etc. Using approximations unless you are asked to do so.

1. In which of the arithmetic sequences given below, 37 is a term ?

- (A) 4, 9, 14, ....
- (B) 7, 12, 17, ....
- (C) 8, 12, 16, ....
- (D) 7, 11, 15, ....

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2. Curved surface area of a cone is 60 square centimetres. What is the curved surface area of another cone with same radius but slant height is one third of this cone ?

- (A) 45 square centimetres
- (B) 60 square centimetres
- (C) 30 square centimetres
- (D) 20 square centimetres

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3. Which of the following is a point on the y-axis ?

- (A) (2, 0)
- (B) (0, 2)
- (C) (1, 5)

(D) (5, 1)

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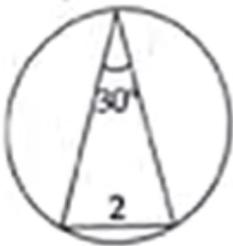
4. Weight of 7 students are given below. What is the median score ?  
44, 42, 40, 47, 41, 38, 45

- (A) 42
  - (B) 41
  - (C) 38
  - (D) 40
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5. Which of the following is the algebraic form of the arithmetic sequence 6, 10, 14, .... ?

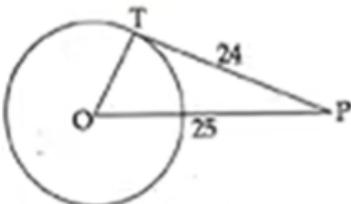
- (A)  $4n + 1$
  - (B)  $6n + 4$
  - (C)  $5n + 1$
  - (D)  $4n + 2$
- 

6. What is the diameter of the circle in the figure ?



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

7. Consider the above figure and read the following statements.



**Statement 1:** The length of the tangent drawn from the point P to the circle is 24 centimetres. If OP is 25 centimetres, then the radius of the circle is 7 centimetres.  
**Statement 2:** A tangent to a circle is perpendicular to the radius through the point of contact.

Now choose the correct answer from those given below.

- (A) Statement 1 is true, statement 2 is false
  - (B) Statement 1 is false, statement 2 is true
  - (C) Both statements are true, statement 2 is the reason of statement 1
  - (D) Both statements are true, statement 2 is not the reason of statement 1
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**8.** The coordinates of two points of a line are (3, 1) and (5, 2).

Read the following statements.

- (i) Slope of the line is 2
- (ii) Slope of the line is  $\frac{1}{2}$
- (iii) (9, 4) is a point on this line
- (iv) (4, 9) is a point on this line

Now choose the correct answer from those given below.

- (A) (i) and (iii) are true
  - (B) (ii) and (iv) are true
  - (C) (ii) and (iii) are true
  - (D) (i) and (iv) are true
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**9.** In the figure, a sector of the circle with central angle  $120^\circ$  is given. If a dot is put in the circle without looking, what is the probability that the dot is in the shaded region ?



**10(A).** A person is asked to say a three digit number.

- (i). What is the probability that all the three digits of this number are the same ?
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10(A)(ii). What is the probability that it is a multiple of 5, which is less than 200 ?

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OR

10(B). A box contains four slips numbered 1, 3, 5, 7 and another box contains three slips numbered 2, 4, 6. If one slip is drawn from each box.

(i). What is the probability that the product of the numbers being a prime ?

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10(B)(ii). What is the probability that the product of the numbers is a multiple of 7 ?

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11. 7th term of an arithmetic sequence is 100 and 11th term is 140.

(i) What is fifteenth term of this sequence ?

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11. 7th term of an arithmetic sequence is 100 and 11th term is 140.

(ii) What is the third term of this sequence ?

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12(A). The sum of first 3 terms of an arithmetic sequence is 30 and the sum of first 7 terms is 140.

(i) What is the second term of this sequence ?

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12(A). The sum of first 3 terms of an arithmetic sequence is 30 and the sum of first 7 terms is 140.

(ii) What is the fourth term of this sequence ?

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12(A). The sum of first 3 terms of an arithmetic sequence is 30 and the sum of first 7 terms is 140.

(iii) Write the first three terms of this sequence.

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OR

12(B). Sum of first and 25th terms of an arithmetic sequence is 70.  
(i) What is the sum of 4th and 22nd terms of this sequence ?

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12(B). Sum of first and 25th terms of an arithmetic sequence is 70.  
(ii) What is the 13th term of this sequence ?

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12(B). Sum of first and 25th terms of an arithmetic sequence is 70.  
(iii) Find the sum of first 25 terms of this sequence.

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13. The table below gives 45 students, classified according to their scores obtained in an examination.

| Scores       | Number of students |
|--------------|--------------------|
| 30 - 40      | 5                  |
| 40 - 50      | 6                  |
| 50 - 60      | 8                  |
| 60 - 70      | 10                 |
| 70 - 80      | 9                  |
| 80 - 90      | 7                  |
| <b>Total</b> | <b>45</b>          |

They are lined up according to their scores.

(i) The score of the student at which position is taken as the median ?

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13. (ii) According to the assumptions used to calculate the median, what is the score of the 20th student ?

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13. (iii) Calculate the median score.

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## SECTION C

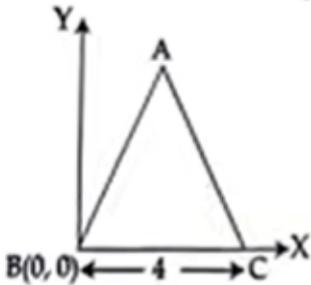
14. A circle is drawn with the line joining the points  $(4, 3)$  and  $(8, 5)$  as diameter.  
(i) What are the coordinates of the centre of the circle ?

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14. (ii) If  $(5, 2)$  is a point on one end of another diameter, what are the coordinates of the other end of that diameter ?

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15. In the figure, triangle ABC is equilateral.



(i) What are the coordinates of C ?

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15. (ii) Calculate the height from A to BC.

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15. (iii) What are the coordinates of A ?

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16(A). A circle is drawn with line joining the points  $(3, 5)$  and  $(5, 9)$  as diameter.  
(i) What are the coordinates of the centre of the circle ?

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16(A). (ii) What is its radius ?

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16(A). (iii) Write the equation of the circle.

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OR

16(B). (i) Find the slope of the line passing through the points (3, 5) and (5, 9).

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### SECTION D

17(A). One side of a rectangle is 30 metre longer than the other and its area is 351 square metres.

(i) Write the above information as a second degree equation.

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17(A). (ii) Calculate the length of the shorter side.

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OR

17(B). Find two numbers with sum 4 and product 2.

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18(i). Write the sequence of natural numbers which leaves a remainder 1 on division by 4.

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18(ii). Is this an arithmetic sequence ? Why ?

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18(iii). Write the algebraic form of the arithmetic sequence got by adding 2 to each term of the above sequence.

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19(A). Sum of first  $n$  terms of an arithmetic sequence is  $n^2 + 6n$ .

(i) What is the sum of first 7 terms ?

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19(A). (ii) How many terms of this sequence, starting from the first, must be added to get 315 ?

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OR

19(B). 5, 11, 17, .... is an arithmetic sequence.

(i) Write the algebraic form of this sequence.

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19(B). (ii) Calculate the sum of first 15 terms of this sequence.

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19(B). (iii) Write the sum of first n terms of this sequence.

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20(i). Write the polynomial  $x^2 - 12x + 32$  as the product of two first degree polynomials.

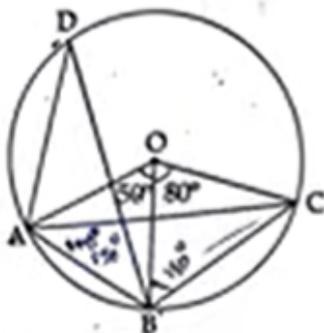
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20(ii). For what values of x, the polynomial  $x^2 - 12x + 32$  becomes zero ?

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### SECTION C

21. In the figure O is the centre of the circle and A, B, C are points on the circle.  $\angle AOB = 50^\circ$ ,  $\angle BOC = 80^\circ$ .



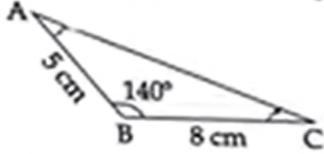
(i) Calculate  $\angle ADB$ .

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21. (ii) Calculate all angles of triangle ABC.

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22. Calculate the area of triangle ABC.



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23(A). The base radius and height of a solid metal cylinder are 8 centimetres and 15 centimetres. By melting it and recasting, how many cones of base radius 6 centimetres and slant height 10 centimetres can be made ?

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OR

23(B). A toy is in the shape of a square pyramid of base edge 18 centimetres and height 12 centimetres. What is the total cost of painting 500 such toys at 120 rupees per square metre ?

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24(A). From the top of a mobile tower, two steel wires are stretched to either side and attached to the ground, making angles  $70^\circ$  and  $48^\circ$ . The distance between the feet of the wires is 40 metres.

(i) Draw a rough sketch showing these details.

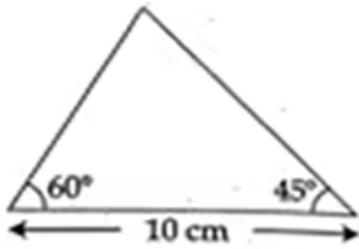
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24(A). (ii) What is the height of the tower ?

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OR

24(B). In the figure one side of the triangle is 10 centimetres and angles on that side are  $60^\circ$  and  $45^\circ$ . Calculate the area of the triangle.



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25. Draw a triangle of circum radius 3 centimetres and two of the angles  $75^\circ$  and  $50^\circ$ .

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26. Draw a rectangle of area 18 square centimetres and a square of same area.

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27. Draw a circle of radius 2.5 centimetres. Draw a triangle of two angles  $70^\circ$  and  $50^\circ$  with its sides touches the circle.

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