

SSLC MODEL QUESTION PAPER 2021

MATHEMATICS

THIRUVANANTHAPURAM EDUCATIONAL DISTRICT

Time :2 ½ hours

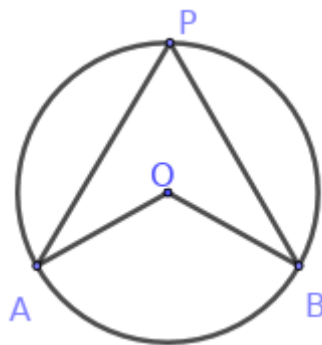
Maximum Marks: 80

Questions 1- 5 . Choose the correct answer from the bracket. (One mark each)

1 The algebraic form of an arithmetic sequence is $4n+3$. What is first term of the sequence?

(4, 5, 3, 7)

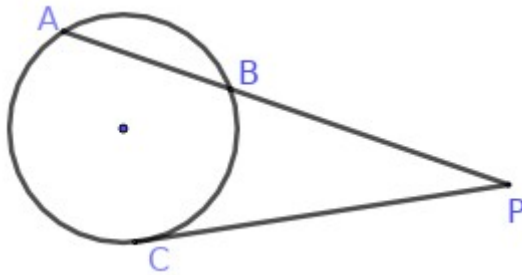
2



If $\angle AOB = 120^\circ$. What is the measure of $\angle APB$?

(30° , 60° , 240° , 120°)

3



From the above picture, $PA = 9\text{cm}$, $PB = 4\text{cm}$, what is the length of PC ?

(3cm, 6cm, 5cm, 10cm)

4 A sector of central angle 60° is cut from a circle of radius 10cm .It is bended to form a cone, what is the slant height of the cone ?

(5cm, 7cm, 10cm, 15cm)

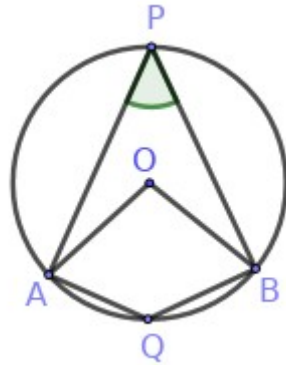
5 Which of the following is a point on the X axis ?

((4,1) , (-4,1) , (0,4), (4,0))

From questions 6 - 10, each question carries Two marks.

- 6 (a) Write the arithmetic sequence with first term 4 and common difference 3.
(b) Write the algebraic form.

7



If $\angle AOB = 130^\circ$, Find

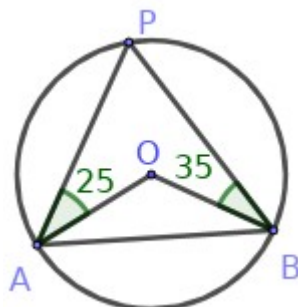
- (a) $\angle P$
(b) $\angle Q$

- 8 The weights of 11 children in a school cricket club are 35, 39, 32, 36, 40, 30, 34, 37, 38, 33, 31 (kgs). Find the median weight.
- 9 Write the polynomial $P(x) = x^2 - 9$ as the product of two first degree polynomials
- 10 (a) Find the midpoint of the line segment joining the points (-2, 6) and (3, 1).
(b) Find the slope of the line

[From questions 11 - 20, each question carries Three marks]

- 11 In the arithmetic sequence 6,11,16..... find
- (a) Common difference
(b) 7th term
(c) Sum of 15 terms
- 12 Tenth term of an arithmetic sequence is 15 and fifteenth term is 10.
- (a) Find the common difference
(b) Find the First term
(c) What is 25th term

- 13 In the figure O is the centre of the circle



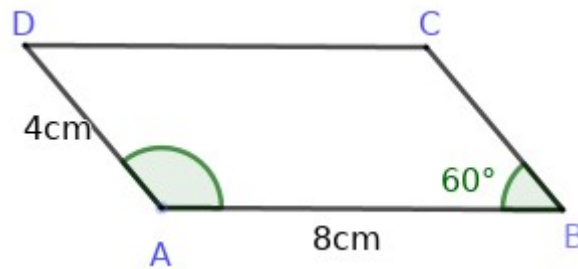
- (a) What is the measure of $\angle APO$
- (b) What is the measure of $\angle BPO$
- (c) What is the measure of $\angle AOB$

14 Draw tangent at a point on the circle with radius 3cm.

15 Each two digit number is written on a paper slip and these are all put in a box.
If a slip is taken from it

- (a) What is the probability to get a number with both digits same?
- (b) What is the probability that the product of the digits is a perfect square?

16



ABCD is a parallelogram. $AB = 8\text{cm}$, $AD = 4\text{cm}$, $\angle B = 60^\circ$

- (a) What is the perpendicular distance from C to AB ?
- (b) What is the area of parallelogram ABCD?

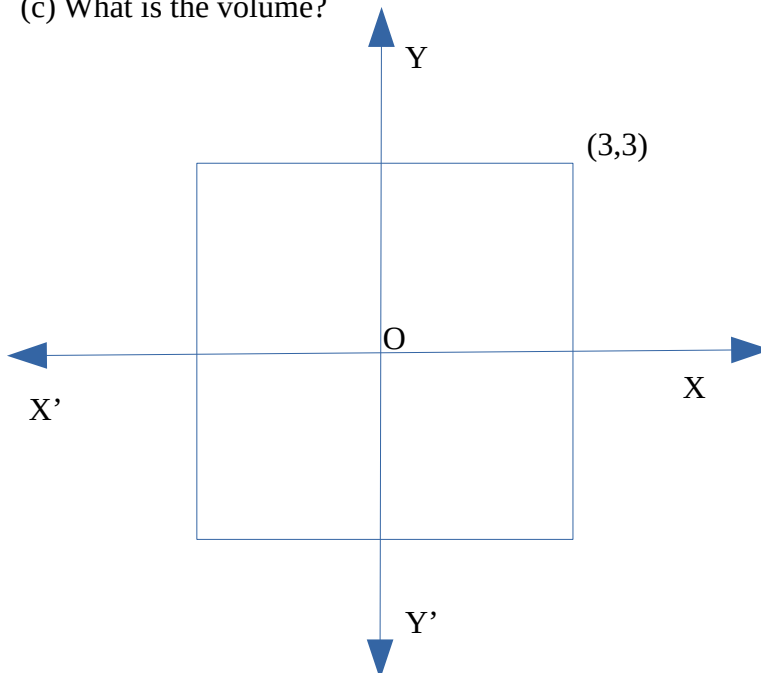
17 (a) Draw tangents from an external point which is at a distance of 7cm away from the centre of circle with radius 3cm.

(b) Measure the lengths of tangents?

18 Base radius and height of a cone are respectively 3cm and 4cm.

- (a) Find slant height
- (b) What is the curved surface area?
- (c) What is the volume?

19



What are the coordinates of the other three vertices?

20 $P(x) = x^2 - 8x + 14$

(a) Find $P(2)$

(b) Write $P(x) - P(2)$ as the product of two first degree polynomials.

[From questions 21 - 30, each question carries Four marks]

21 Perimeter of a rectangle is 42cm and its area 20cm².

(a) Find the sum of length and breadth .

(b) Form a second degree equation connecting length breadth and area.

(c) Find the length and breadth of rectangle .

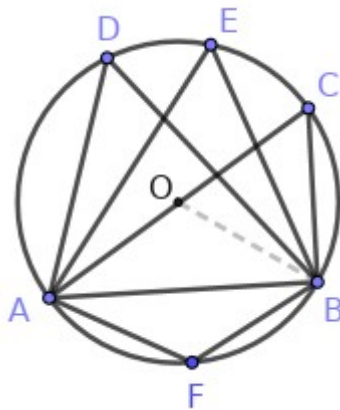
22 (a) What is the sum of first 20 natural numbers

(b) Find the sum of first 20 terms of the sequence 5 , 10 , 15 ,

(c) If 3 is added to each term of the sequence write its algebraic form.

(d) Find the sum of first 20 terms of the new sequence.

23 'O' is the centre of the circle. $\angle D = 80^\circ$ find the following



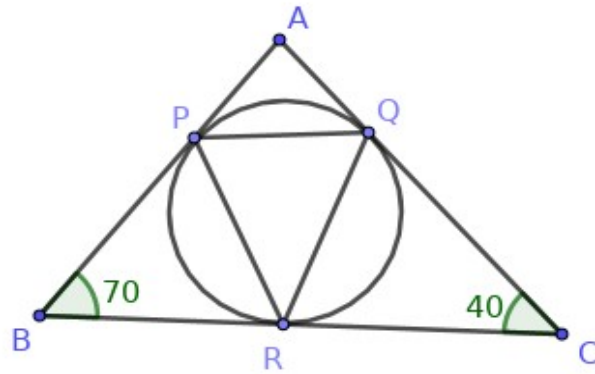
(a) $\angle E$

(b) $\angle ABC$

(c) $\angle AFB$

(d) $\angle AOB$

24 Draw the X and Y axes and mark the points (4,3) , (-4,-3) , (-3,2) .



In the figure, the sides of the large triangle are tangents of the circumcircle of smaller triangle through its vertices. Find

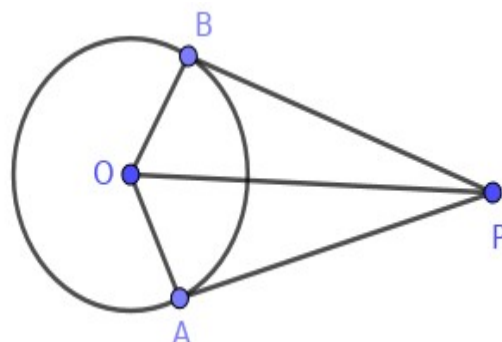
- (a) $\angle A$
- (b) $\angle RPQ$
- (c) $\angle PQR$
- (d) $\angle PRQ$

26 The perimeter of the base of a square pyramid is 96cm and its height is 16cm.

- (a) What is the length of a base edge?
- (b) What is the slant height?
- (c) Find the lateral surface area?

27 Draw a rectangle of sides 4cm and 3cm .Draw a square having area equal to the area of the rectangle.

28



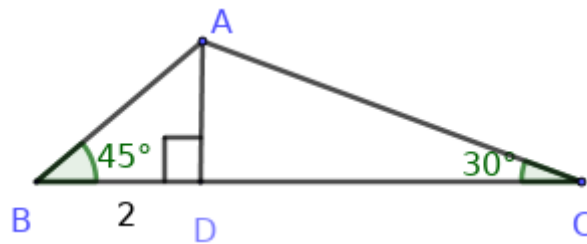
PA and PB are two tangents of circle with centre 'O' Radius of the circle is 5cm, $PO = 13$ cm,

- (a) Find the length of PA
- (b) Find the length of PB

(c) Find the Area of ΔPAO

(d) Find the Area of quadrilateral PAOB

29



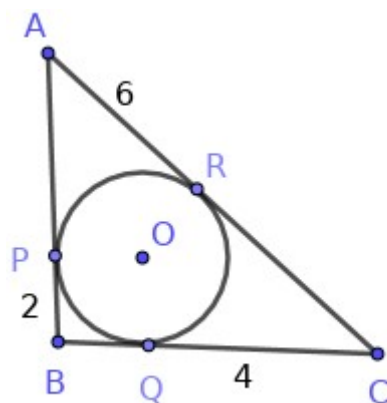
In the figure $\angle B = 45^\circ$ $\angle C = 30^\circ$ $BD = 2\text{cm}$

(a) Find the length of AD

(b) Find the length of CD

(c) Find the area of ΔABC

30



In the figure the incircle of ΔABC touches the sides at the points P, Q, R .

$BP = 2\text{cm}$, $CQ = 4\text{cm}$, $AR = 6\text{cm}$ then

(a) Find AP , BQ , CR

(b) Find the length of the sides of ΔABC

(c) Find the radius of the circle

(d) Find the area of ΔABC

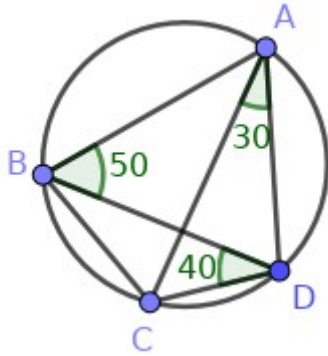
[From questions 31 - 45, each question carries Five marks]

31 The sum of first and 21st terms of an arithmetic sequence is 140.

(a) Find the sum of 6th term and 16th term.

- (b) What is the 11th term.
- (c) Find the sum of first 21 terms
- (d) Find the sum of first 11 terms of the sequence 20, 25, 30,

32. ABCD is a cyclic quadrilateral and $\angle CAD = 30^\circ$, $\angle DBA = 50^\circ$, $\angle BDC = 40^\circ$. Find the measures of all angles of the quadrilateral and angle between the diagonals.



- 33 A box contains 6 red beads and 5 white beads. Another box contains 8 red beads and 4 white beads. If one bead is taken from each box, then
- (a) What is the number of possible pairs?
 - (b) What is the probability of both beads being red ?
 - (c) What is the probability that both beads are white?
 - (d) What is the probability of getting at least one red bead ?
- 34 Draw a triangle of circumradius 2.5 cm and two of the angles 30° and 70° .
- 35 The sides of a rectangle ABCD are parallel to axes. If A (2, 3) and $AB = 5$ cm, $BC = 3$ cm Find
- (a) The coordinates of the vertices B, C, D
 - (b) Length of the diagonals
- 36 The base perimeter of a cone is 20π cm and slant height is 18 cm. It is made by rolling a sector sheet.
- (a) What is the radius of the sector?
 - (b) What is the radius of the cone?
 - (c) What is the central angle of the sector ?
 - (d) Find the curved surface area of the cone ?
- 37 Draw a circle of radius 3 cm. Draw a triangle of angles $60^\circ, 70^\circ$ with all its sides touching the circle
- 38 Sum of the first 4 terms of an arithmetic sequence is 72. Sum of the first 9 terms is also 72.
- (a) What is the 5th term of the sequence?
 - (b) Find the sum of the first 5 terms
 - (c) Write the sequence.

- 39 A boy standing on the bank of a river sees the top of a tree on the other bank at an angle of elevation of 60° . Stepping 20 m back he sees the top at an angle of elevation of 30° . Draw a rough figure and calculate the height of the tree and width of the river.
- 40 (a) What is the radius of the largest sphere that can be carved from a cube of edge 12 cm?
 (b) Find the surface area and volume of the sphere.
 (c) What is the volume of the cone of maximum size that can be carved from a cube of edge 12 cm?
- 41 (a) Write the sequence which leaves remainder 2 when dividing the numbers in between 200 and 500 by 4 .
 (b) Find the first term
 (c) Find the last term
 (d) Find the sum of all terms of the sequence
- 42 A circle is drawn with (5,3) as centre. (5,6) is a point on the circle
 (a) What is the radius of the circle?
 (b) Write the equation of the circle
 (c) What is the distance from the centre of the circle to the x- axis?
 (d) What is the length of the tangents from the origin to the circle?
- 43 P(2, -1), Q(3, 4) , R(-2, 3) and S(-3, -2) are the vertices of a quadrilateral.
 (a) Find the lengths of the sides of the quadrilateral.
 (b) Find the length of its diagonals.
 (c) Suggest a suitable name for the quadrilateral.
 (d) Calculate the area of the quadrilateral.
- 44 Longest side of a rectangle is 8cm more than the shorter side. Area is 180cm^2 . Take the shorter side as 'x'
 (a) Write the longest side in terms of x
 (b) Write the algebraic equation involving the sides and area
 (c) Find the sides of the rectangle
- 45 The table given below shows the number of children in a class arranged according to their heights.

Height (Centimetres)	Number of children
120 - 130	7
130 - 140	9
140- 150	10
150 -160	10
160 - 170	9

- (a) The mark of the student at what position is taken as the median.
 (b) Calculate the median mark

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 SSLC Self Evaluation Tool
 Headmasters Forum
 Tirur Educational District
 Sub: Mathematics (set 1)

Time:45 minutes

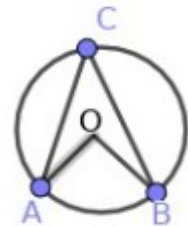
marks:20

Instructions

- *Answer any questions from 1 to 14
- *Maximum score is 20
- *First 10 minutes given as cool of time

Questions 1 to 3 carries 1 score for each

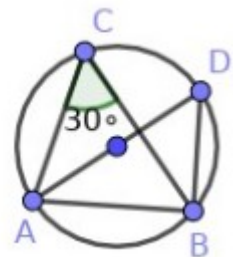
- 1)Fourth term of the sequence 6,10,14,...
 [15, 16, 17, 18]
- 2)In the figure O is the centre of the circle . If $\angle AOB = \dots$
 [30° , 45° , 60° , 90°]



- 3)One is asked to say a two digit number . What is the probability of it is a prime number?
 [$\frac{1}{10}$, $\frac{2}{10}$, $\frac{3}{12}$, $\frac{4}{10}$]

Questions 4 to 6 carries 2 score for each

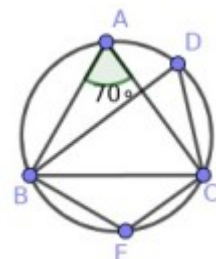
- 4)The algebraic form of an arithmetic sequence is $2n+3$.
 - a)What is the common difference ?
 - b)Write the 10th term
- 5) in the figure AD is the diameter of the circle . C and B are two point on the circle. If $\angle C=30^\circ$
 - a) $\angle D = \dots$?
 - b) $\angle ABD = \dots$?



- 6)Consider an arithmetic sequence 5, 9, 13....
 - a) what is the algebraic expression?
 - b)Is 91 a term of this sequence? Why?

Questions 7 to 9 carries 3 score for each

- 7)7th term of an arithmetic sequence is 17 and 17th term is 7
 - a)What is its common difference?
 - b)Find 24th term?
 - c)Find the sum of first 47 terms.
- 8)In triangle ABC , $\angle BAC = 70^\circ$
 - a) $\angle BDC = \dots$?
 - b)How many cyclic quadrilateral are there in the figure?
 which are they?
 - c)Find $\angle BEC$.



9) Numbers 1 to 20 are written on paper slips and put in a box. One slip is taken from it

- a) What is the probability of being a multiple of 5?
- b) What is the probability of getting an even number?
- c) What is the probability of getting a prime number?

Questions 10 to 12 carries 4 score for each

10) Draw the triangle ABC of circumradius 4cm and with the angles 60° and 50°

11) The sum of the first five terms of an arithmetic sequence is 150 and the sum of the first ten terms is 550

- a) What is the third term of the sequence?
- b) What is the sum of 3rd term and 8th term?
- c) Find the common difference of the sequence?

12) A rectangle is to be made with perimeter 100cm and area 600cm^2

- a) Calculate the sum of length and breadth
- b) Taking the breadth as X, Find the length
- c) Write down a second degree equation based on the given facts.
- d) Find the length and breadth using this equation

Questions 13 to 14 carries 5 score for each

13) 4

7 , 10

13 , 16 , 19

22 , 25 , 28 , 31

.....

.....

- a) Write next two lines
- b) How many numbers contain in the first 10 lines
- c) What is the last number in the 10th line
- d) What is the first number in the 10th line
- e) Find the sum of all the numbers in the first 10 lines

14) Draw a rectangle of side 5cm and 4cm .Draw a square of the same area.

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SSLC Self Evaluation Tool
Headmasters Forum
Tirur Educational District
Sub: Mathematics (set 1)

Time:45 minutes
marks:20

Standard -X

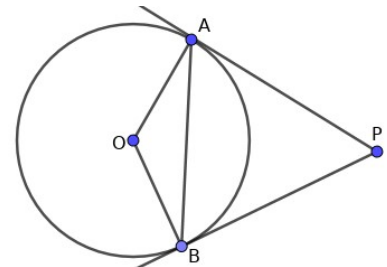
Instructions

- *Answer any questions from 1 to 13
- *Maximum score is 20
- *First 10 minutes given as cool of time

Questions 1 to 3 carries 1 score for each

- 1) Which of the following points lies on the y-axis?
[a) (4,0), b) (2,3), c) (0,-2), d) (1,1)]
- 2) PA and PB are two tangents to the circle from the point P.
Which of the following is right angle?

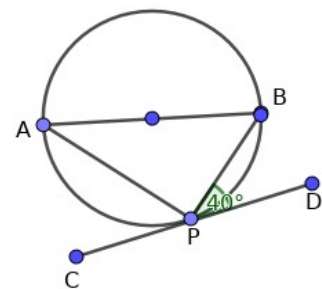
- [a) $\angle AOB$, b) $\angle OAP$, c) $\angle BAP$, d) $\angle ABP$]



- 3) In the square ABCD, AC=8cm. How much is one side?
[a) $8\sqrt{2}$ cm, b) $4\sqrt{2}$ cm, c) 8cm, d) 4cm]

Questions 4 to 5 each carries 2 Marks

- 4) What is the radius of the sector to be used to make a cone of base radius 5cm and slant height 15cm? And central angle?
- 5) In the figure AB is the diameter and CD is a tangent through the point P. If $\angle BPD=40^\circ$, find $\angle PAB$ and $\angle PBA$.



Questions 6 to 7 each carries 3 marks

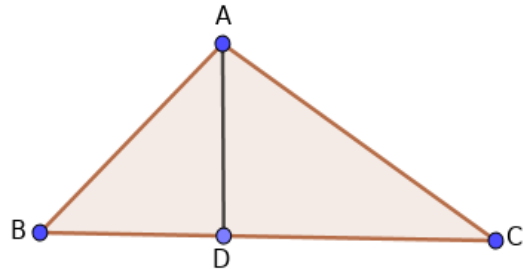
- 6) Draw a circle of radius 3cm. Mark a point 7cm away from its centre. Draw tangents to the circle from the point. Measure the tangents.
- 7) When the sun is at an elevation of 60° , the length of the shadow of a tree is 15m. What is the height of the tree.

Questions 8 to 10 each carries 4 marks

- 8) Draw a circle of 2.5cm and draw a triangle with angles 55° , 80° and all three sides touching the circle.
- 9) A(2,1), B(3,4), C(-3,6) are three vertices of a triangle.
a) Calculate the length of the sides.
b) Prove that the points are the vertices of a right triangle.
- 10) A cone shaped toy has height 16cm and base radius 12cm
a) Find the slant height
b) Calculate the total surface area
c) What is the total cost of painting 500 such toys, at 80 rupees per square meter?

Questions 11 to 13 each carries 5 marks

- 11) In triangle ABC, $\angle B=45^\circ$, $\angle C=30^\circ$,
AD=6cm
a) find $\angle BAC$
b) Find the angles in the triangle ABD
c) Find the sides of triangle ABC



- 12) A cylinder with radius 15cm and height 32cm is melted and recast in the form of cones, its radius and slant height 3 cm and 5cm respectively
a) Find the volume of cylinder
b) Find the height of the cone
c) Calculate the curved surface area of the cone
d) Find the volume of the cone
e) How many cones can be made?
- 13) A boy saw the top of a building under construction at an elevation of 30° . The completed building was 12m higher and the boy saw its top at an elevation of 60° from the same spot .
a) Draw a rough sketch
b) What is the height of the building?
c) Find the distance between boy and building

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SSLC Self Evaluation Tool
Headmasters Forum
Tirur Educational District
Sub: **Mathematics** (set 2)

Standard-X

Time:45 minutes
marks:20

Instructions

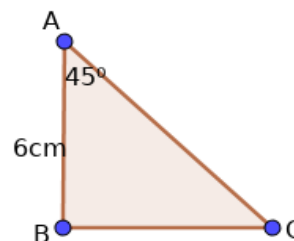
- *Answer any questions from 1 to 14
- *Maximum score is 20
- *First 10 minutes given as cool of time

Questions 1 to 3 carries 1 score for each

1. Which of the following is a point on the x- axis
[(3,2) , (2,3), (0,3), (3,0)]

2. In the figure AB=6 cm .Find the length of AC?

[6, $6\sqrt{2}$, $6\sqrt{3}$, 12]



3. Find the slant height of a cone which made by a sector with radius 6 cm
[12, 6, 9, 3]

Questions 4 to 6 carries 2 score for each

4. A(2,1),B(8,9) are the coordinates of end points of diameter of the circle.
Find the radius?
5. Draw a tangent at any point on the circle of radius 4cm.
6. A circle divided in to 12 equal parts, one of the sector is rolled up to create a cone
(a) Find the central angle of the sector.
(b) What is the ratio of the slant height and radius of the cone.

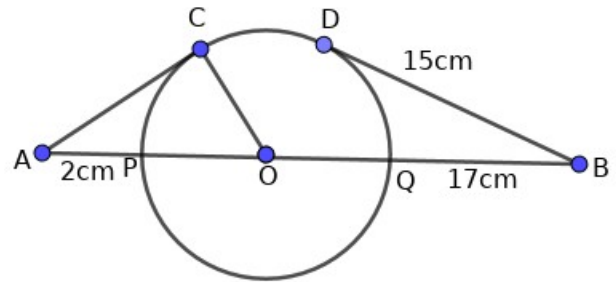
Questions 7 to 9 carries 3 score for each

7. Draw a circle of radius 3cm. Mark a point 7cm away from its centre.
Draw tangents from this point to the circle and measure it.
8. A cone - shaped tent has 4m height and base diameter 6m
(a) What is the slant height of the tent.
(b) Calculate the area of canvas is used to make it.

9. In the figure O is the centre of circle and AC, BD are tangents.

If $OB=17\text{cm}$, $BD=15\text{cm}$, $AP=2\text{cm}$.

- Find the length of OC .
- Find the perimeter of triangle AOC .



Questions 10 to 12 carries 4 score for each

- Draw a circle of radius 2.5cm and draw a triangle of angles $55^\circ, 65^\circ, 60^\circ$ with all its sides touching the circle.
- A rhombus with sides 10cm and one angle is 37°
 - What is the smallest distance between two opposite sides.
 - What is the length of the smallest diagonal.
- Draw x -axis and y -axis and mark the points $P(-2,1)$, $Q(4,4)$.
 - Draw a rectangle with diagonal PQ .
 - Write the coordinates of the other vertices of the rectangle.

Question 13 to 14 carries 5 score for each

- The boy is standing at the riverside sees the top of a tree in the opposite side at an elevation 60° . When he stepped back 14m he sees it at an elevation of 30° .
 - Draw a rough figure
 - Find the height of the tree
 - What is the width of the river?
 - Find out the distance between the boy and tree.
- Prove that $A(2,4)$, $B(4,-2)$, $C(-2,4)$, $D(-4,2)$ are the vertices of a square.