



PM 01 MM 10 E

Time : $2 \frac{1}{2}$ Hours

Class : X

Total Score : 80

MM 10 E

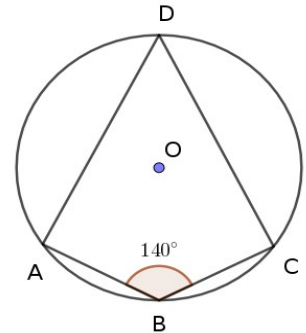
MATHEMATICS

PART 1

Section A

(Answer any four questions from 1 to 6. Each question carries 1 score)

- Write the next term of the arithmetic sequence 1, 5, 9, 13, . . .
- In the figure, O is the centre of the circle. $\angle ABC = 140^\circ$.
What is the measure of $\angle ADC$?
- There are 24 black beads and 12 white beads in a box. If we draw a bead from this box, what is the probability that it is white ?
- What is the distance between the points (1, 5) and (4, 5) ?
- The radii of two spheres are in the ratio 1 : 2. What is the ratio of their surface areas ?
- If $(x-1)$ is a factor of the polynomial $x^2 + 6x + k$, then find the value of k.



Section B

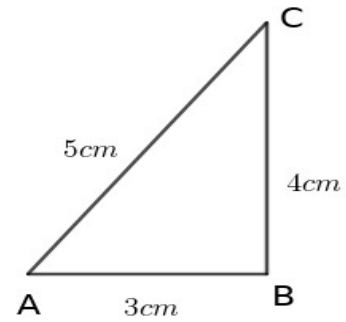
(Answer all questions from 7 to 10. Choose the correct answer from the bracket. Each question carries 1 score)

- The equation of a circle with centre at the origin is $x^2 + y^2 = 36$. What is its radius?
(3, 6, 9, 18)

8. In $\triangle ABC$, $\angle B = 90^\circ$, $AB = 3 \text{ cm}$, $BC = 4 \text{ cm}$ and $AC = 5 \text{ cm}$.

If $\tan A = \frac{4}{k}$, then the value of k is

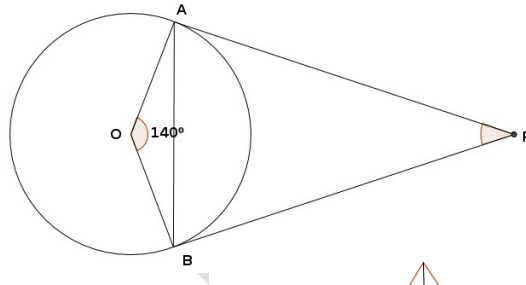
(3, 4, 5, 10)



9. In the figure, $\angle AOB = 140^\circ$.

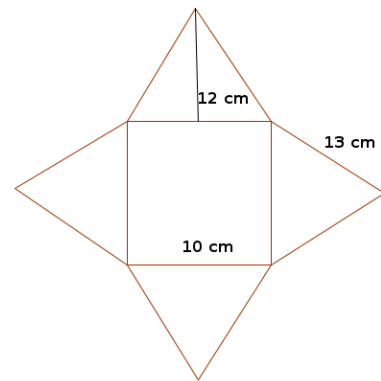
What is the measure of $\angle P$?

(90° , 70° , 50° , 40°)



10. The faces of a square pyramid is open and as shown in the figure. The slant height of the pyramid is :

(5 cm, 10 cm, 12 cm, 13 cm)



PART 2

Section A

(Answer any three questions from 11 to 15. Each question carries 2 scores)

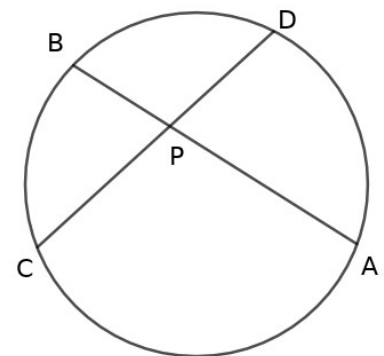
11. Write the first term and common difference of the arithmetic sequence whose algebraic expression is $7n+3$.

12. Chords AB and CD are intersecting at P. $CD = 7 \text{ cm}$,

$PD = 3 \text{ cm}$ and $PB = 2 \text{ cm}$

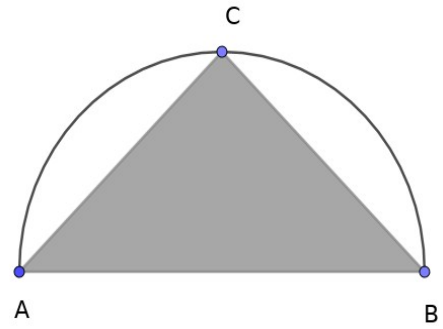
(a) What is the length of PC?

(b) What is the length of PA?



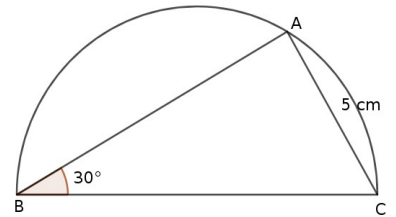
13. ΔABC is an isosceles right angled triangle in a semicircle of diameter AB .

- (a) If the area of the semicircle is $18\pi \text{ cm}^2$. What is the area of the triangle?
 (b) Calculate the probability of a dot, put without looking, be within the triangle.



14. In the figure BC is a diameter of the semi circle. $\angle B = 30^\circ$, $AC = 5 \text{ cm}$.

- (a) What is the measure of $\angle A$?
 (b) What is the radius of the semi circle?



15. The marks got by 10 students in an examination are given below:

25, 29, 20, 31, 37, 43, 33, 41, 40, 45

Find the median mark.

Section B

(Answer any two questions from 16 to 18. Each question carries 2 scores)

16. The algebraic expression for the Sum of first n terms of an arithmetic sequence is

$$3n^2 + 2n$$

- a) Find its first term.
 b) What is the common difference of the sequence?

17. What is the radius of the incircle of the triangle with perimeter 30 cm and area 45 cm^2 ?

18. A circle with centre at the origin and passes through the point $(6, 8)$.

- (a) Find its radius.
 (b) Write the equation of the circle,

PART 3

Section A

(Answer any three questions from 19 to 23. Each question carries 4 scores)

19. Draw a triangle of circumradius 4 centimetres and two of the angles 35° and 55° . Measure and write the length of its longest side.

20. The perimeter of a rectangle is 44 centimetres and its area is 117 square centimetres.

(a) If the length of one side of the rectangle is taken as $11 + x$, what is the length of the other side ?

(b) Find the length of the sides of the rectangle.

21. Draw a circle of radius 3 cm . Draw a triangle of angles 40° , 60° and 80° with all its sides touching the circle.

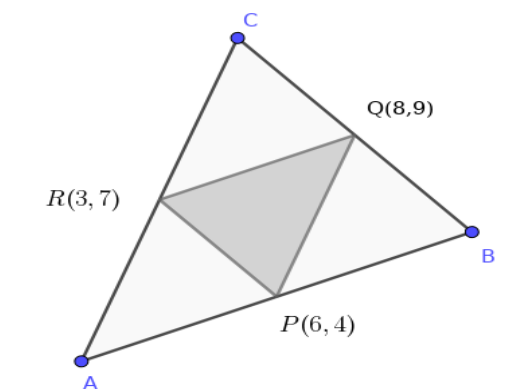
22. (a) What is the volume of a solid metal sphere of radius 6 cm ?

(b) This solid sphere is melted and recast into 24 cones, each of height 9 cm. Find its radius.

23. In the figure P, Q, R are the midpoints of of the sides of ABC. If P, Q and R has the coordinates (6, 4), (8, 9) and (3,7).

(a) What type of the quadrilateral is APQR ?

(b) Find the coordinates of all the vertices of $\triangle ABC$.



Section B

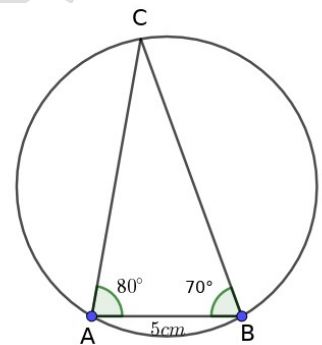
(Answer any one question from 24 to 25. Each question carries 4 scores)

24. In class 10 A there are 20 boys and 15 girls and in 10 B there are 15 boys and 15 girls. One student from each class is to be selected for participation in the Math Fair.

- What is the probability of both being boys ?
- What is the probability of one being a boy and the other a girl ?
- What is the probability of at least one being a girl?

25. In $\triangle ABC$. $\angle A = 80^\circ$, $\angle B = 70^\circ$, $AB = 5$ cm.

- What is the radius of the circumcircle of $\triangle ABC$?
 - What is the length of the other two sides ?
- ($\sin 70^\circ = 0.94$, $\sin 80^\circ = 0.98$, $\cos 70^\circ = 0.34$, $\cos 80^\circ = 0.17$)



PART 4

Section A

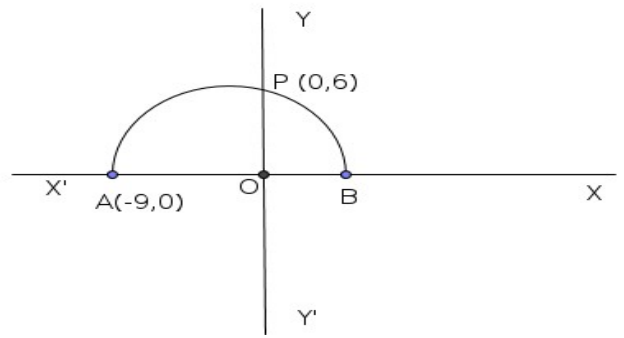
(Answer any three questions from 26 to 29. Each question carries 6 scores)

- Write all the pairs of natural numbers which can be the length and breadth of a rectangle having an area 10 square centimetres.
 - Draw a rectangle of area 10 square centimetres. Draw a square having the same area of the rectangle.
27. A boy saw the top of a building under construction at an elevation of 30° . The completed building was 18 meter higher and the boy saw its top at an elevation of 60° from the same spot.
- Draw a rough figure based on the given details.
 - What is the height of the building ?
 - What is the distance between the building and the boy ?

28. In the figure, O is the origin. A semicircle with AB as diameter cuts the y-axis at

$P(0,6)$. The coordinates of A is $(-9,0)$

- (a) Find the length of OA and OP
- (b) What is the length of OB ?
- (c) Write the coordinates of B.



29. A sector of central angle 216° and radius 10 cm

is rolled up to form a cone.

- (a) What is the slant height and radius of the cone so formed ?
- (b) Find its volume.

Section B

(Answer any two question from 30 to 32. Each question carries 6 scores)

30. (a) What is the sum of first n natural numbers ?

(b) How many consecutive natural numbers starting from 1 should be added to get the sum 325 ?

31. (a) If $P(x) = x^2 - 7x + 11$, find $P(2)$ and $P(3)$.

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

(c) Find the solutions of the equation $P(x) - P(2) = 0$.

32. The table below shows the classification of families in a locality, according to their monthly electricity charge in rupees.

Electricity Charge (in Rupees)	Number of families
50 – 150	5
150 – 250	4
250 – 350	10
350 – 450	7
450 – 550	6
550 – 650	3

- (a) If the number of families are arranged according to their electricity charges in ascending order, the family at what position is taken as the median electricity charge ?

- (b) What is the assumed electricity charge of the 10th family ?
(c) Find the median electricity charge.

PART 5

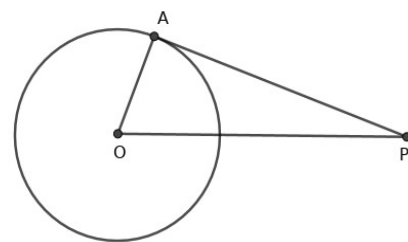
Section A

(Answer any two questions from 33 to 35. Each question carries 8 scores)

33. Consider the number pattern given below:

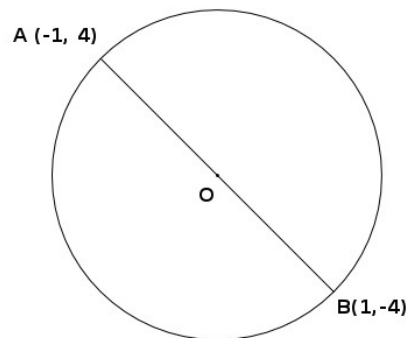
2
4 6
8 10 12
14 16 18 20

- a) Write the next two lines of the pattern above.
b) Write the algebraic expression of the sequence 2, 4, 6, ...
c) Write the first and last numbers of the 10th line. Find the sum of all numbers in the 10th line.
34. (a) In the figure, O is the centre of the circle and PA is a tangent. What is the measure of $\angle OAP$?



- (b) In the above figure, if $OP = 25$ cm and $PA = 24$ cm. Find the radius of the circle.
(c) Draw a circle of radius 3 cm . Mark a point P outside the circle at a distance of 8 cm from the centre. Draw tangents from P to the circle. Measure the length of the tangents.

35. In the figure, O is the centre of the circle and AB diameter. The coordinates of A and B are $(-1, 4)$, and $(1, -4)$.



- a) Write the coordinates of the centre of the circle.
- b) Another diameter of the circle is CD . The coordinates of C is $(-1, -4)$.
- (i) What are the coordinates of D ?
- (ii) What is the slope of CD ?
- (iii) Write the coordinates of one more point on the line through C and D .
- c) What is the diameter of the circle ?
