



SSLC PRE MODEL EVALUATION JANUARY 2023

MATHEMATICS

Time : 1½ Hrs

(English)

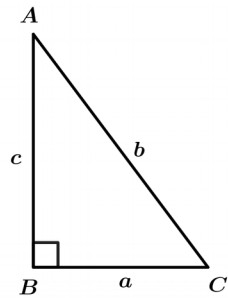
Score : 40

Answer any 3 questions from 1 to 4 . Each question carries 2 scores . ($3 \times 2 = 6$)

- (a) Write down the coordinates of the origin .
(b) What is the y coordinate of any point on the x axis ?

2. In triangle ABC , $\angle B = 90^\circ$, $BC = a$, $AC = b$, $AB = c$

- Find $\tan A$.
- Prove that $\tan A \times \tan C = 1$.



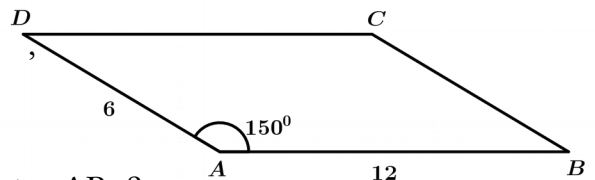
- Calculate the volume of a hemisphere of radius 6 centimetres .
- What is the inradius of a triangle of sides 3 , 4 , 5 centimetres ?

Answer any 4 questions from 5 to 10 .Each question carries 3 scores .

($4 \times 3 = 12$)

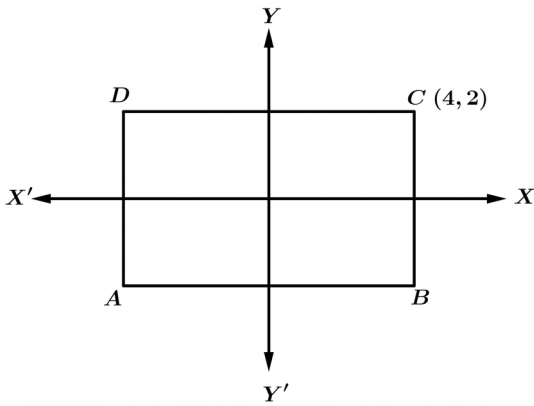
- Draw a circle of radius 3 centimetres and mark a point on it . Draw a tangent to the circle through that point
- A sector of radius 12 centimetres and central angle 60° is rolled up to make a cone
 - What is the slant height of the cone ?
 - What is the base radius of the cone ? .

7. In parallelogram ABCD , $AB = 12$ centimetres ,
 $AD = 6$ centimetres and $\angle A = 150^\circ$



- What is the perpendicular distance from D to AB ?
 - Calculate the area of the parallelogram .
- The base area of square pyramid is 144 square centimetres and its volume is 384 cubic centimetres .What are its height and slant height ?

9.



In the picture , ABCD is a rectangle .Its sides are parallel to the axes and origin is its mid point . What are the coordinates of other three vertices ?

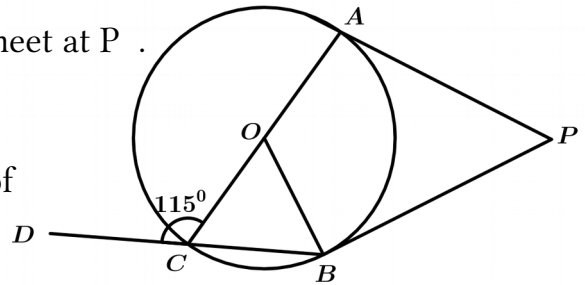
10. In the picture , A, B , C are points on the circle .

The tangents through the points A and B meet at P .

The chord Bc is extended to D and

$\angle OCD = 115^\circ$. What are the measures of

$\angle BCO$, $\angle AOB$ and $\angle P$?



Answer any 3 questions from 11 to 16 . Each question carries 4 scores. (3 × 4 = 12)

11. Draw a circle of radius 3.5 centimetres and mark a point P , 8 centimetres away from the centre of the circle . Draw tangents from P to the circle .

12. When sun is at an elevation 30° ,the length of the shadow of a tree is $23\sqrt{3}$ metres

(a) Draw a rough figure using the given detail .

(b) Compute the height of the tree .

(c) What would be the length of the shadow of the same tree , when the sun is at an elevation 25° ?

$$[\sin 25^\circ = 0.42 \quad , \quad \cos 25^\circ = 0.91 \quad , \quad \tan 25^\circ = 0.46 \quad]$$

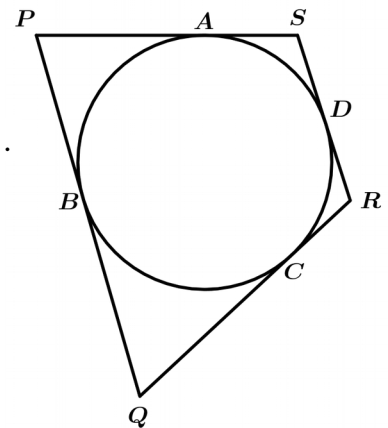
13. In the picture , the circle touches the sides of the quadrilateral PQRS at the points A, B , C and D .

PA = 2.6 centimetres , QB = 3.3 centimetres ,

RC = 1.3 centimetres , , SD = 1.5 centimetres ,

(a) What are the lengths of the lines PB and QR ?

(b) Calculate the perimeter of the quadrilateral .



14. Draw the x and y axes and mark the points $A(1, 0)$, $B(3, 0)$, $C(5, 0)$ and $D(3, 2\sqrt{3})$

15. From a solid hemisphere of radius 9 centimetres, a cone of maximum possible size is carved out.

(a) What are the base radius and height of the cone?

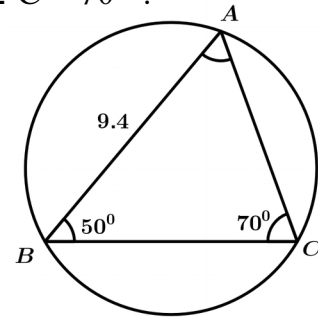
(b) What fraction the volume of the hemisphere is the volume of the cone?

16. In the picture, $AB = 9.4$ centimetres, $\angle B = 50^\circ$, $\angle C = 70^\circ$.

(a) What is the measure of $\angle A$?

(b) What is the diameter of the circle?

(c) Compute the lengths of the other two sides of the triangle?



$$[\sin 50^\circ = 0.76, \cos 50^\circ = 0.64, \tan 50^\circ = 1.19$$

$$\sin 70^\circ = 0.94, \cos 70^\circ = 0.34, \tan 70^\circ = 2.74]$$

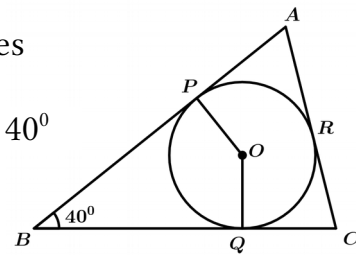
Answer any 2 questions from 17 to 21. Each question carries 4 scores.

$$(2 \times 5 = 10)$$

17. (a) In the picture, circle centred at O touches the sides

of the triangle at the points P , Q and R . $\angle B = 40^\circ$

What is the measure of $\angle POQ$?



(b) Draw a circle of radius 2.5 centimetres. Draw a triangle with two angles 40° and 90° and all its sides as tangents to this circle.

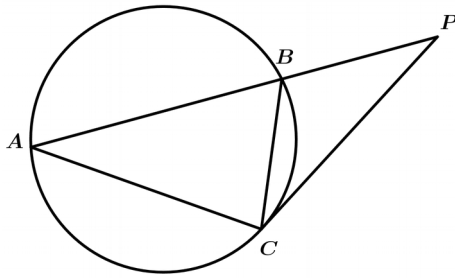
18. The base radius and length of a metal cylinder are 4 centimetres and 10 centimetres. It is melted and recast into 15 small spheres of equal size.

(a) Calculate the volume of the cylinder.

(b) Calculate the volume of a small sphere.

(c) How many spheres can be made?

19.



In the picture , the chord AB is extended to meet the tangent through C at the point P .

- (a) If $\angle BCP = 35^\circ$, what will be the measure of $\angle BAC$?

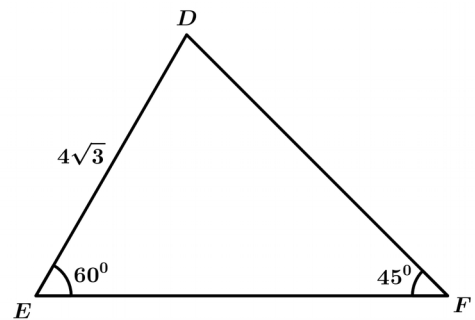
(b) Check whether the angles of the triangles APC and BPC are equal or not .

(c) Prove that $PA \times PB = PC^2$.

20. In the picture , $DE = 4\sqrt{3}$ centimetres ,

$\angle E = 60^\circ$ and $\angle F = 45^\circ$.

- (a) What is the measure of $\angle D$?
- (b) What is the perpendicular distance from D to EF ?
- (c) What is the length of EF ?
- (d) If the ratio of the angles of a triangle is $3 : 4 : 5$, what is the ratio of their sides?



21. In the picture , the circle touches the sides of the triangle at K , L , M

$\angle LKM = 55^\circ$ and $\angle KML = 70^\circ$. Write down

the measures of the following angles

- (a) $\angle CLM$
- (b) $\angle KLB$
- (c) $\angle B$
- (d) $\angle A$

