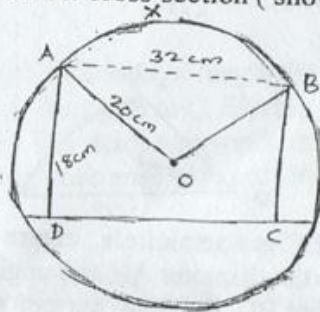


WORK SHEET (RADIANS)

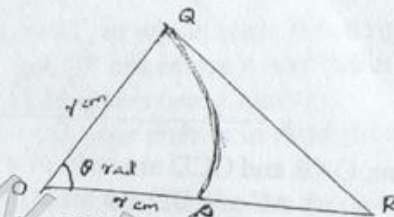
- 1) The diagram shows the circular cross-section of a uniform cylindrical log with centre O and radius 20cm. The points A, X and B lie on the circumference of the cross-section and AB = 32cm.

- Show that angle AOB = 1.855 radians, correct to 3 decimal places.
- Find the area of the sector AXBO.
The section AXBCD, where ABCD is a rectangle with AD = 18cm is removed.

- Find the area of the new cross-section (shown shaded in the diagram)



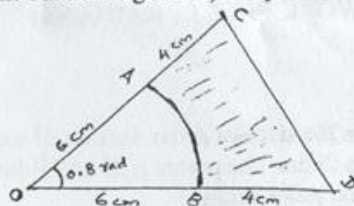
- 2) In the diagram OPQ is a sector of a circle, centre O and radius r cm. Angle QOP = θ radi. The tangents to the circle at Q meets OP extended at R.
- show that the area, $A \text{ cm}^2$ of the shaded region is given by $A = \frac{1}{2}r^2(\tan\theta - \theta)$
 - In the case where $\theta = 0.8$ and $r = 15$, evaluate the length of the perimeter of the shaded region.



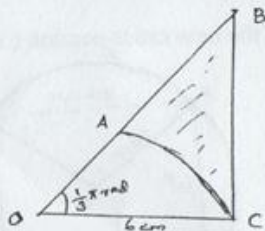
- 3) The diagram shows a semicircle ABC with centre O and radius 8 cm. Angle AOB = θ radians.
- In the case where $\theta = 1$, calculate the area of the sector BOC.
 - Find the value of θ for which the perimeter of sector AOB is one half of the perimeter sector BOC.
 - In the case where $\theta = \frac{1\pi}{3}$, show that the exact length of the perimeter of the triangle ABC is $(24 + 8\sqrt{3})$ cm.



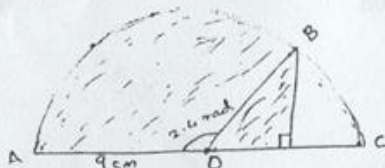
- 4) In the diagram, OCD is an isosceles triangle with $OC = OD = 10\text{cm}$ and angle $COD = 0.8\text{radians}$. The points A and B , on OC and OD respectively, are joined by an arc of a circle with centre O and radius 6cm . Find
- the area of the shaded region
 - the perimeter of the shaded region.



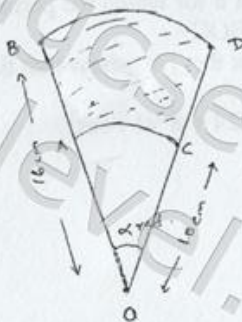
- 5) In the diagram, AC is an arc of a circle, centre O and radius 6cm . The line BC is perpendicular to OC and OAB is a straight line. Angle $AOC = \frac{1}{3}\pi$ radians. Find the area of the shaded region, giving your answer in terms of π and $\sqrt{3}$.



- 6) In the diagram, ABC is a semicircle, centre O and radius 9cm . The line BD is perpendicular to the diameter AC and angle $AOB = 2.4\text{ rad}$.
- Show that $BD = 6.08\text{cm}$, correct to 3 significant figures.
 - Find the perimeter of the shaded region.
 - Find the area of the shaded region.

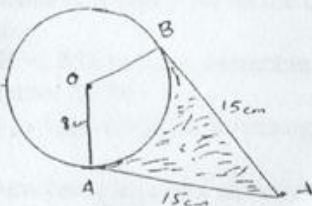


- 7) In the diagram, OAB and OCD are radii of a circle, centre O and radius 16cm . Angle $AOC = \alpha$ rad. AC and BD are arcs of circles, centre O and radii 10cm and 16cm respectively.
- In the case where $\alpha = 0.8$, find the area of the shaded region.
 - Find the value of α for which the perimeter of the shaded region is 28.9cm .

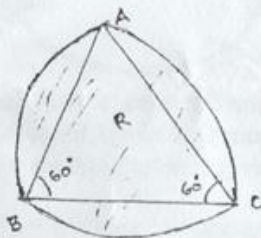


- 8) The diagram shows a circle with centre O and radius 8 cm . Points A and B lie on the circle. The tangents at A and B meet at the point T and $AT = BT = 15\text{ cm}$

- Show that angle $AOB = 2.16$ radians, correct to 3 significant figures.
- Find the perimeter of the shaded region.
- Find the area of the shaded region.



- 9) The triangle ABC is equilateral with each side of length 6 cm . With centre A and radius 6 cm , a circular arc is drawn joining B to C . Similar arcs are drawn with centres B and C and with diagram. The shaded region R is bounded by the arcs AB , BC and CA . Calculate, giving your answer in cm^2 to 3 significant figures
- the area of triangle ABC .
 - the area of R .



- 10) The diagram shows triangle ABC , in which angle B is a right angle, $AB = 3\text{ cm}$ and $BC = 6\text{ cm}$. The circular arc BP has centre A and radius 3 cm and the circular arc BQ has centre C and radius 6 cm . Calculate
- the size of angle A , giving your answer in radians correct to 4 significant figures.
 - The area of the region BPC , bounded by the arc BP and the lines PC and CB .
 - The area of the region BPQ , bounded by the line PQ and the arcs BP and BQ .
 - The perimeter of the region BPQ bounded by the line PQ and the arcs BP and BQ .

