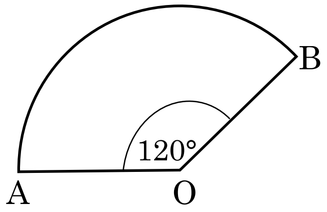
Sectors and Arcs Exa

Q1. OAB below is a sector of a circle.

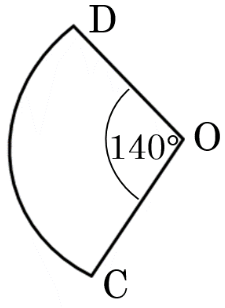


OB = 7 cm

a) Find the area of OAB to 1 d.p.
(2 marks)

b) Find the arc length AB to 1 d.p.
(2 marks)

Q2. Below OCD is a sector of a circle, with radius 18 cm.



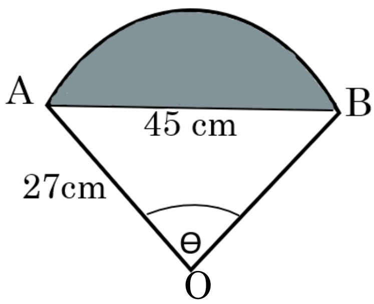
Find the perimeter of the shape correct to 2 decimal places.
(3 marks)

Q3. OAB is a sector of a circle, which has centre O. The area of the circle is 400 cm². Given that angle AOB is 40°, find the following, leaving your answer in terms of π.

a) the radius of the sector OAB
(3 marks)

b) the perimeter of the sector OAB
(2 marks)

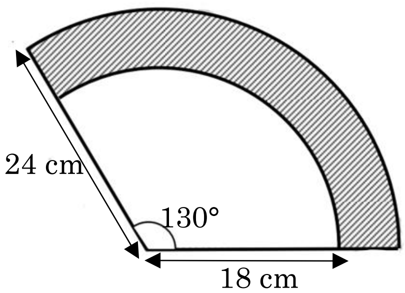
Q4. AOB is a sector, AB is a chord, and angle AOB = θ.



a) Find the length of the arc AB **[5]**

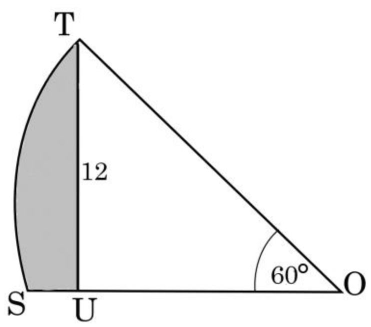
b) Find the shortest distance from O to the chord. **[3]**

Q5. The picture shows part of two concentric circles, of radii 18 and 24 cm. Find the arc length and area of the shaded region.



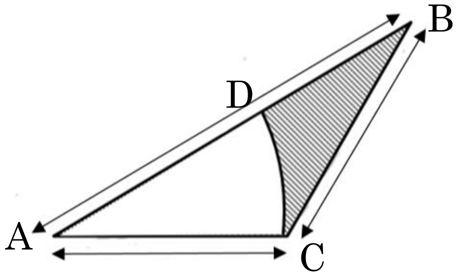
(6 marks)

Q6. Below, OST is sector, and angle OUT is 90°. Find the area of the shaded region to 1 decimal place.



(4 marks)

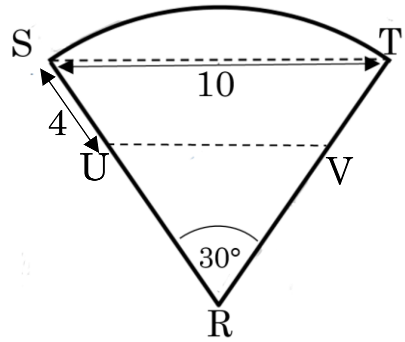
Q7. In triangle ABC below, AB = 4, AC = 1 and BC = $\sqrt{13}$. ACD is a sector with radius 1.



Find an exact expression for the shaded area.

(6 marks)

Q8. In the sector RST, ST is a chord.

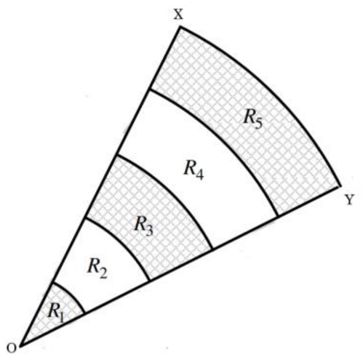


ST = 10,
SU = 4

Find the area of the region enclosed by the dotted lines.

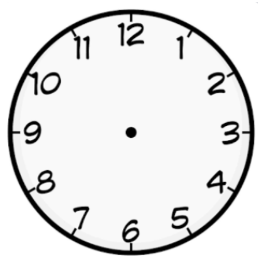
(5 marks)

Q9. OXY is a sector of a circle, containing equally spaced sectors within in it. Find the ratio of the areas of region R_2 to region R_5.



(4 marks)

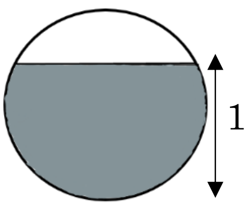
Q10. Hands are attached to the clock-face below, so the time shown is 10.00 am. When the time reaches 5.00pm, the tip of the hour hand has travelled 34 cm.



Work out the length of the hour hand to 1 d.p.

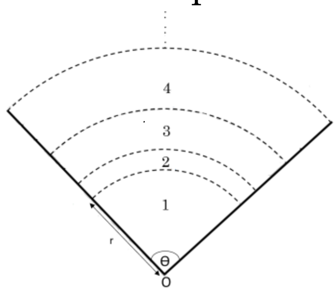
(4 marks)

Q11. A circular oil pipe, with diameter 20 cm, has cross-section below. If oil flows at a constant height through the pipe at 0.25 m/s, find the volume of oil which passes through the pipe in 1 hour, to 3 s.f.



(7 marks)

Q12. For a sport, an area is formed from concentric circles all having centre O. Region 1 ends r metres from O, with each adjacent area finishing 15% further from O than the previous area.



Find a fully simplified expression for the area of region N in r, θ

(5 marks)