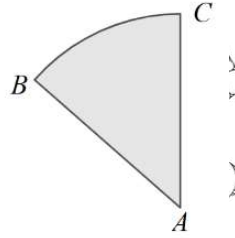
WWW.M4THS.COM
A LEVEL MATHS

(25) Arc Lengths (Radians)

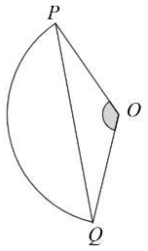
WORKING AT D/E

(1) The diagram below shows sector ABC. The angle at $A = \frac{\pi}{6}$ and $BC = 12$



(a) Without a calculator, show that the arc $BC = 2\pi$.
(b) Hence, find the perimeter of the sector ABC in the from $A + B\pi$.
(c) Given instead the angle at $A = 1.05^c$, without using a calculator, explain what impact that will have on your answer to part (a).

(2) The diagram below shows the sector OPQ. The $< POQ = \frac{2\pi}{3}$, $OP = 8$ and PQ is a straight line.

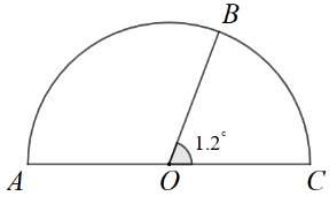


Show that the perimeter of the segment created by the line $PQ = \frac{16\pi}{3} + 8\sqrt{3}$

WORKING AT B/C

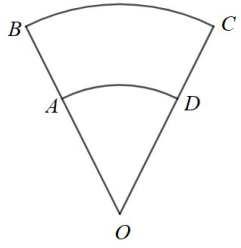
(1) (a) A sector has centre O and arc AB of length $\frac{10\pi}{3}$. Given that $AO = 4$, find $< AOB$ as a multiple of π.
(b) Write down the perimeter of the sector in exact form.
(c) A straight line AB is drawn to create a segment within the sector. Find the perimeter of the segment to 3 significant figures.

(2) The diagram below shows a semicircle centre O. $OA = OB = OC$ and $< BOC = 1.2^c$



Given that the arc length $AC = 10\pi$, show that the perimeter of the sector AOB is 39.4 to 3S.F.

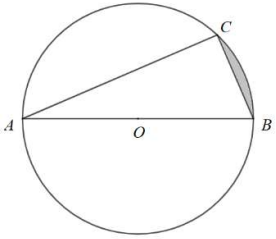
(3) The diagram below shows a sector centre O.



BC and AD are arcs of the sectors OBC and OAD respectively . The length $OB = 9, OD = 5$ and $< AOD = \frac{\pi}{4}$. Find the perimeter of shape $BACD$ in the form $P + Q\pi$.

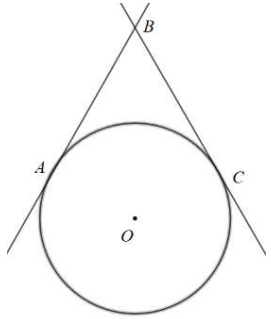
WORKING AT A*/A

(1) The diagram below shows a circle centre O and diameter $AB = 10cm$. The point C lies on the circumference of the circle. The straight line BC creates a shaded segment as shown below.



Given that $< CAB = 0.5^c$, find the perimeter of the shaded segment to 3S.F

(2) The diagram below shows a circle with centre O and radius 1. The points A and C lie on the circumference of the circle and AB and CB are tangents to the circle.



Given than $< ABC = \theta$
(a) Show that the length of the minor arc $AC = \pi - \theta$
(b) Find a simplified expression for the length of the major arc AC.
(c) A straight line AC is drawn. Shown that the area of the triangle $OAC = \frac{\sin\vartheta}{2}$