

9 (a)

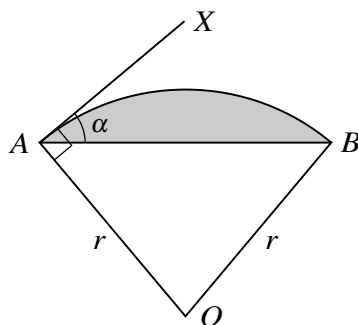


Fig. 1

In Fig. 1, OAB is a sector of a circle with centre O and radius r . AX is the tangent at A to the arc AB and angle $BAX = \alpha$.

(i) Show that angle $AOB = 2\alpha$. [2]

(ii) Find the area of the shaded segment in terms of r and α . [2]

(b)

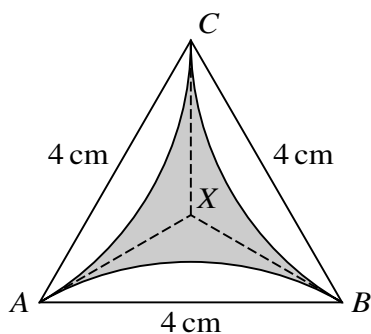


Fig. 2

In Fig. 2, ABC is an equilateral triangle of side 4 cm. The lines AX , BX and CX are tangents to the equal circular arcs AB , BC and CA . Use the results in part (a) to find the area of the shaded region, giving your answer in terms of π and $\sqrt{3}$. [6]