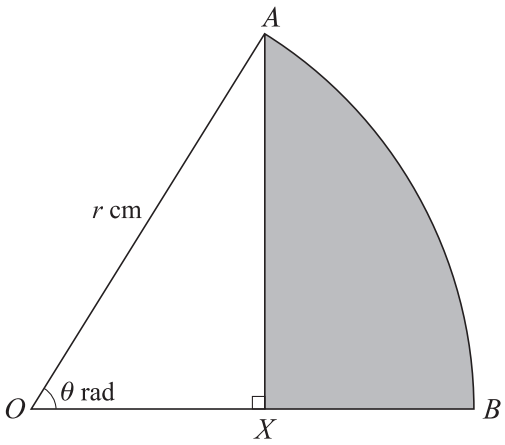
7



In the diagram, AB is an arc of a circle, centre O and radius r cm, and angle $AOB = \theta$ radians. The point X lies on OB and AX is perpendicular to OB.

(i) Show that the area, A cm^2, of the shaded region AXB is given by

$$A = \tfrac{1}{2}r^2(\theta - \sin\theta\cos\theta).$$ [3]

(ii) In the case where $r = 12$ and $\theta = \frac{1}{6}\pi$, find the perimeter of the shaded region AXB, leaving your answer in terms of $\sqrt{3}$ and π. [4]