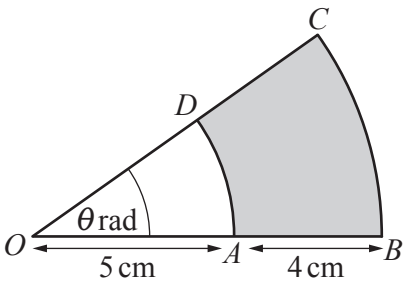
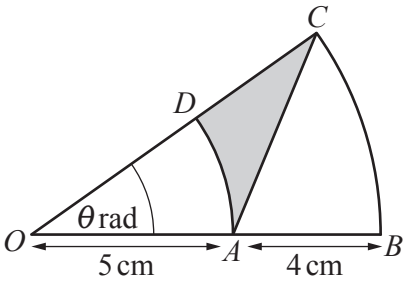
7



In the diagram, AD and BC are arcs of circles with common centre O.
ODC and OAB are straight lines with $OA = 5\,\text{cm}$ and $AB = 4\,\text{cm}$. Angle $BOC = \theta$ radians.
The area of the shaded region $ABCD$ is $4\pi\,\text{cm}^2$.

(a) Find θ. [3]

(b)



The straight line AC is added to the diagram and the region ACD is now shaded.
Find the perimeter of the shaded region ACD. [5]

8 A curve is such that $\frac{d^2y}{dx^2} = \cos\left(4x - \frac{\pi}{4}\right)$. Given that $\frac{dy}{dx} = \frac{3}{4}$ at the point $\left(\frac{3\pi}{16}, \frac{\pi}{4}\right)$ on the curve, find the equation of the curve. [7]