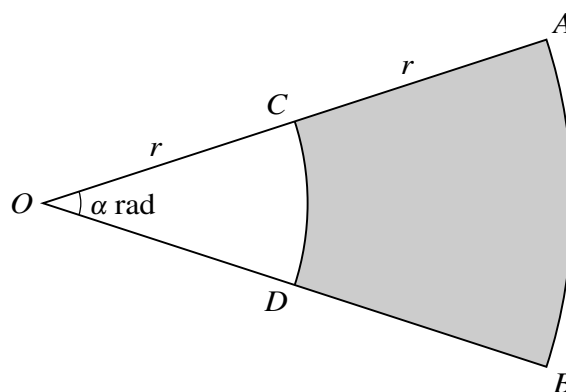


3



In the diagram  $OCA$  and  $ODB$  are radii of a circle with centre  $O$  and radius  $2r$  cm. Angle  $AOB = \alpha$  radians.  $CD$  and  $AB$  are arcs of circles with centre  $O$  and radii  $r$  cm and  $2r$  cm respectively. The perimeter of the shaded region  $ABDC$  is  $4.4r$  cm.

(i) Find the value of  $\alpha$ . [2]

(ii) It is given that the area of the shaded region is  $30 \text{ cm}^2$ . Find the value of  $r$ . [3]