



The diagram shows sector OAB with centre O and radius 11 cm . Angle $AOB = \alpha$ radians. Points C and D lie on OA and OB respectively. Arc CD has centre O and radius 5 cm .

- (i) The area of the shaded region $ABDC$ is equal to k times the area of the unshaded region OCD . Find k . [3]
- (ii) The perimeter of the shaded region $ABDC$ is equal to twice the perimeter of the unshaded region OCD . Find the exact value of α . [4]