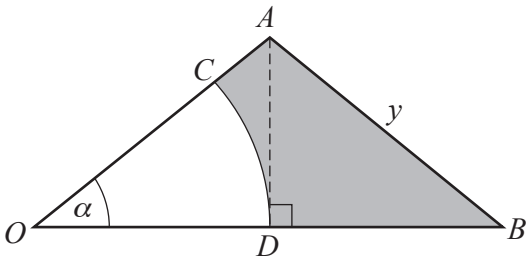
9 In this question all lengths are in centimetres and all angles are in radians.

(a) The area of a sector of a circle of radius 24 is $432\,\text{cm}^2$. Find the length of the arc of the sector. [4]

(b)



The diagram shows an isosceles triangle, OAB, with $AO = AB = y$ and height AD.
OCD is a sector of the circle with centre O. Angle AOB is α.

(i) Find an expression for OB in terms of y and α. [1]

(ii) Hence show that the area of the shaded region can be written as $\frac{y^2}{2}\cos\alpha(2\sin\alpha - \alpha\cos\alpha)$. [3]

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10 In the expansion of $\left(ax+\frac{b}{x^2}\right)^9$, where a and b are constants with $a > 0$, the term independent of x is $-145\,152$ and the coefficient of x^6 is -6912. Show that $a^2b = -12$ and find the value of a and the value of b. [7]

Question 11 is printed on the next page.