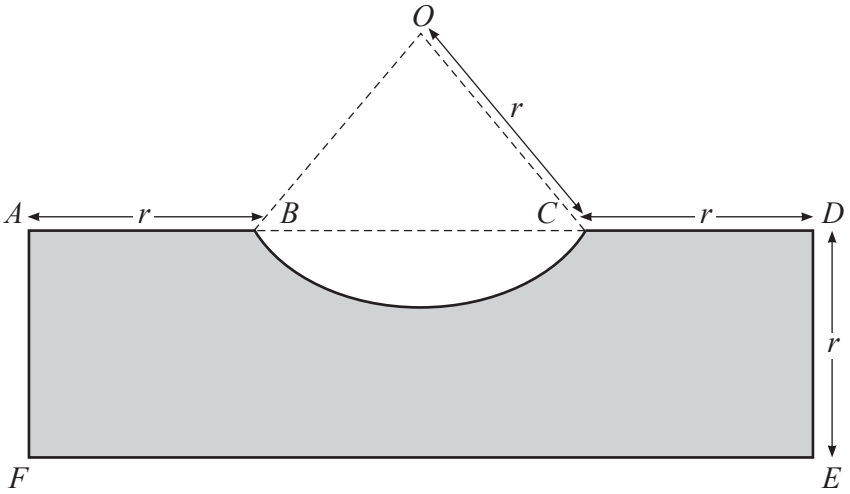
11 In this question all lengths are in centimetres and all angles are in radians.



The diagram shows the rectangle $ADEF$, where $AF = DE = r$. The points B and C lie on AD such that $AB = CD = r$. The curve BC is an arc of the circle, centre O, radius r and has a length of $1.5r$.

(a) Show that the perimeter of the shaded region is $(7.5 + 2\sin 0.75)r$. [5]

(b) Find the area of the shaded region, giving your answer in the form kr^2, where k is a constant correct to 2 decimal places. [4]