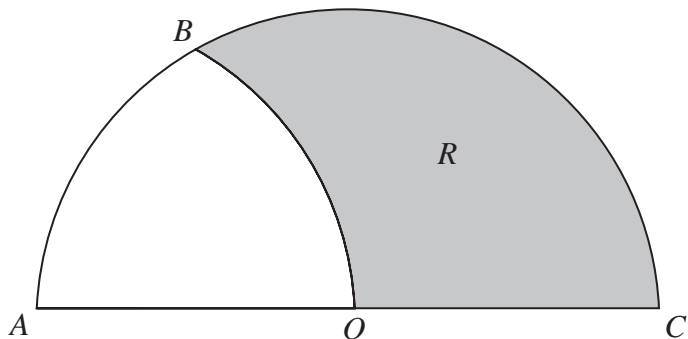


11.



**Figure 4**

Figure 4 shows the design of a badge.

The shape  $ABCOA$  is a semicircle with centre  $O$  and diameter 10 cm.

$OB$  is the arc of a circle with centre  $A$  and radius 5 cm.

The region  $R$ , shown shaded in Figure 4, is bounded by the arc  $OB$ , the arc  $BC$  and the line  $OC$ .

Find the exact area of  $R$ .

Give your answer in the form  $(a\sqrt{3} + b\pi)\text{ cm}^2$ , where  $a$  and  $b$  are rational numbers.