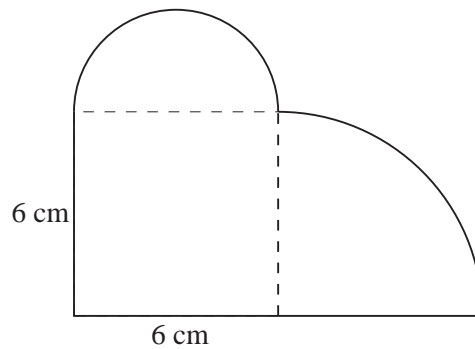




Example 3

The diagram shows a square with sides of length 6 cm. A semicircle has been added to one side of the square and a quarter of a circle (quadrant) added to another side. Calculate the area of the shape.



Solution

$$\begin{aligned} \text{Area of square} &= 6^2 \\ &= 36 \text{ cm}^2 \end{aligned}$$

$$\text{Radius of semicircle} = 3 \text{ cm}$$

$$\begin{aligned} \text{Area of semicircle} &= \frac{1}{2} \times \pi \times 3^2 \\ &= 14.1 \text{ cm}^2 \text{ (3 s.f.)} \end{aligned}$$

$$\text{Radius of quarter circle} = 6 \text{ cm}$$

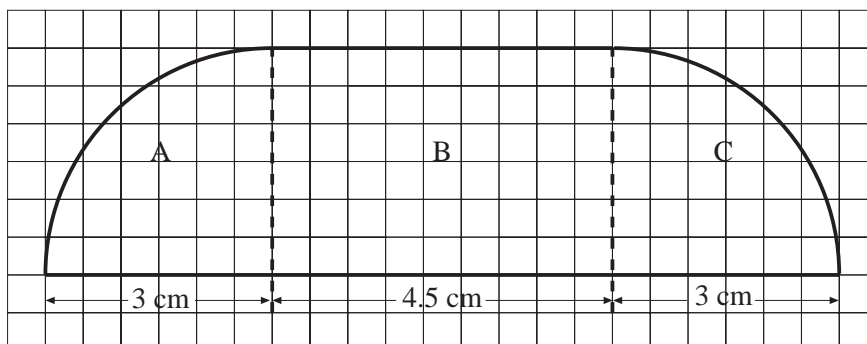
$$\begin{aligned} \text{Area of quadrant} &= \frac{1}{4} \times \pi \times 6^2 \\ &= 28.3 \text{ cm}^2 \text{ (3 s.f.)} \end{aligned}$$

$$\begin{aligned} \text{Total area} &= 36 + 14.1 + 28.3 \\ &= 78.4 \text{ cm}^2 \text{ (3 s.f.)} \end{aligned}$$



Exercises

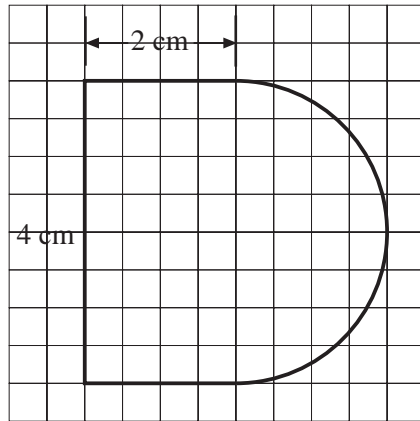
1. (a) Calculate the area of each part of the following shape:



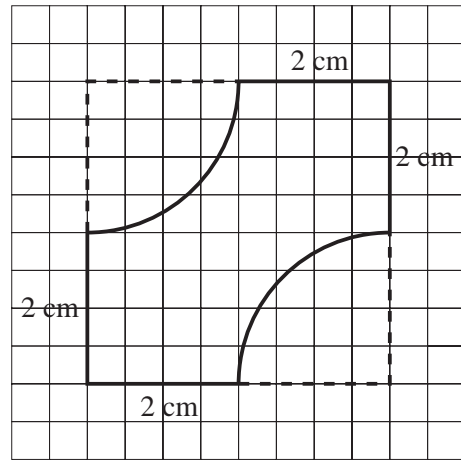
- (b) What is the *total* area of the shape?

2. Calculate the area of each of the following shapes:

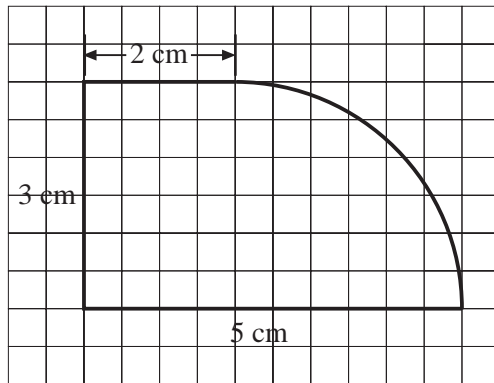
(a)



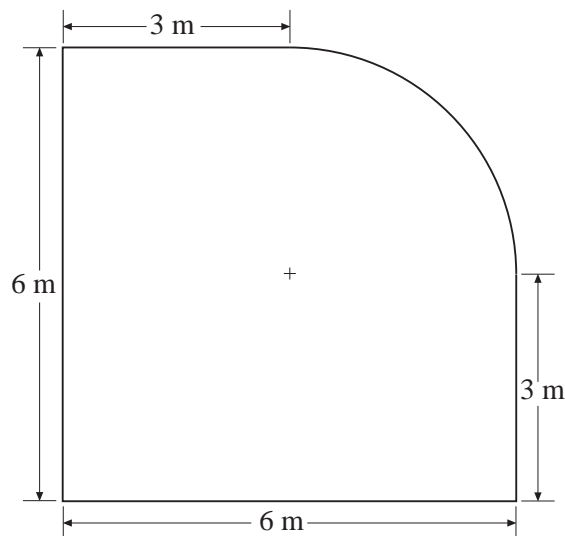
(b)



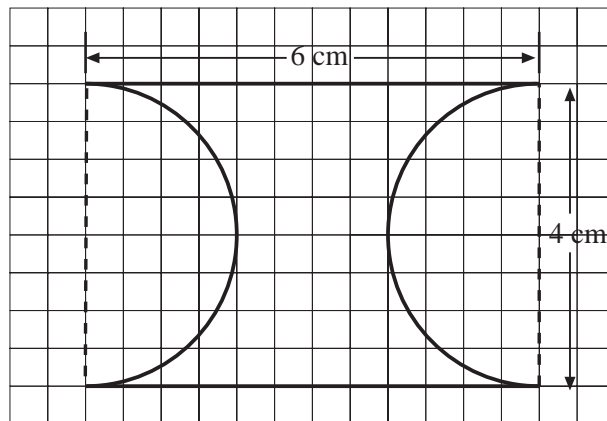
(c)



3. The following diagram shows the plan of a patio. Calculate the area of the patio.



4. Calculate the area and perimeter of the following shape:



5. A Christmas decoration consists of a disc with two holes cut in it, as shown.

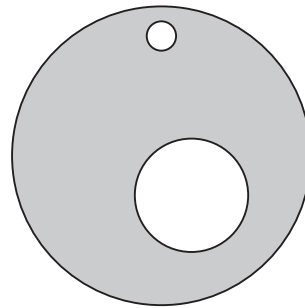
The disc has radius 3.8 cm.

The large hole has radius 1.2 cm.

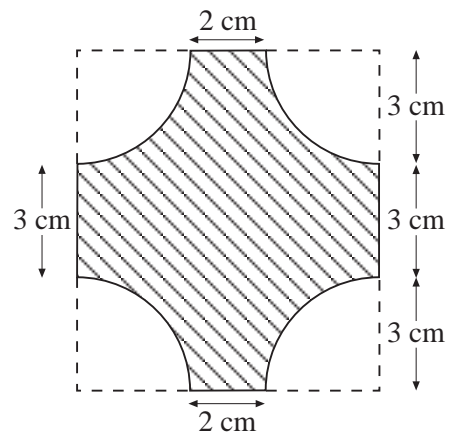
The small hole has radius 0.2 cm.

Both sides of the decoration are painted.

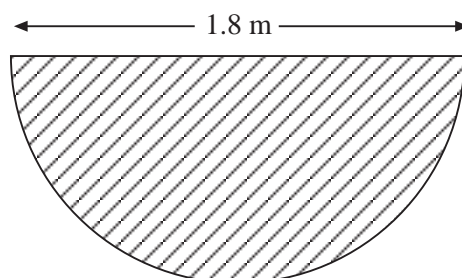
Calculate the area that is painted.

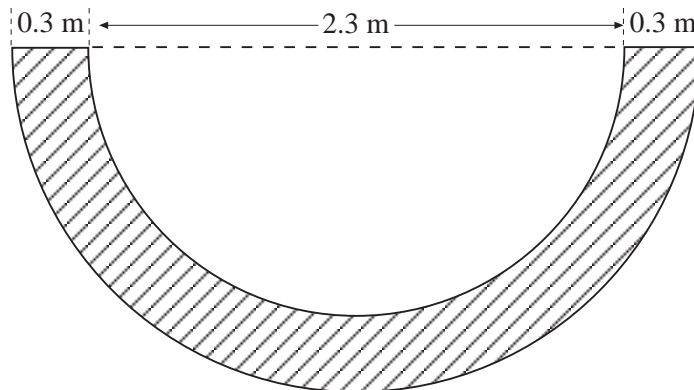
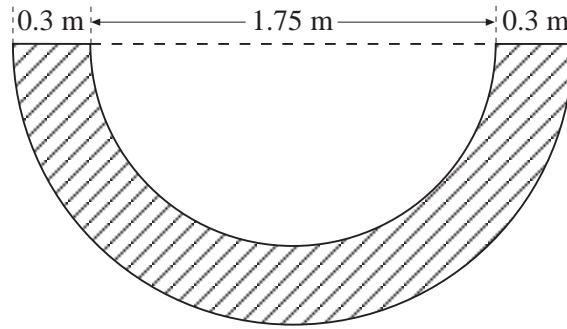


6. Calculate the area and perimeter of the shape shown:



7. A set of steps is to be built with a semicircular shape. Three of the steps are shown in the following diagrams. Calculate the area of each of these three steps.





8. A car wheel has radius 0.25 m. How far does the car travel if the wheel goes round:
- (a) 10 times,
 - (b) 600 times?
9. A wheel of a bicycle has diameter 60 cm. How many times does the wheel revolve on a journey of length:
- (a) 500 m,
 - (b) 2.6 km?
10. Calculate the area and perimeter of the following shapes:

