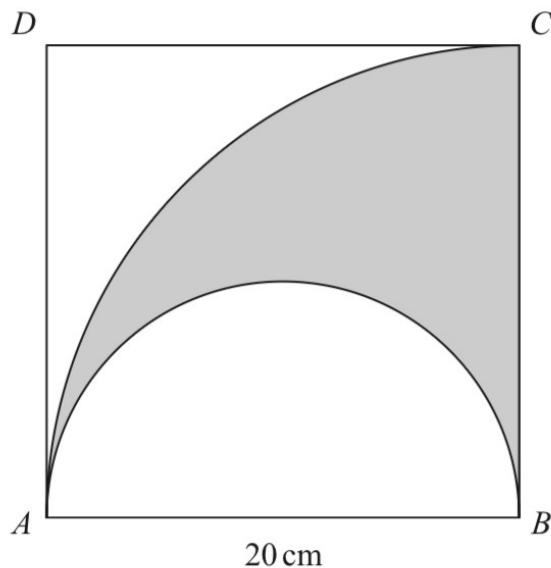


**Question 1 (4 Marks)**

The diagram shows a square  $ABCD$  with sides of length 20 cm. It also shows a semicircle and an arc of a circle.



$AB$  is the diameter of the semicircle.

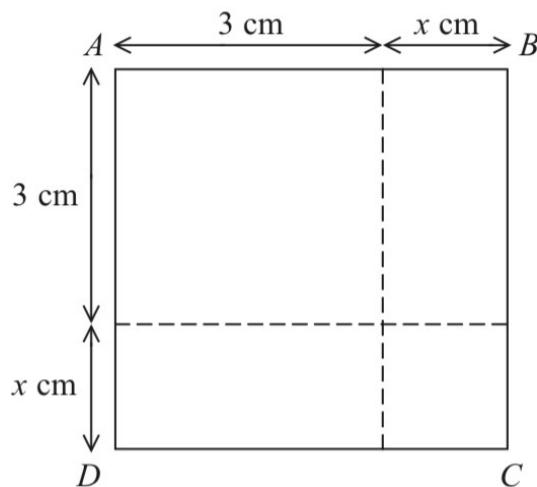
$AC$  is an arc of a circle with centre  $B$ .

Show that 
$$\frac{\text{area of shaded region}}{\text{area of square}} = \frac{\pi}{8}$$

**Question 2 (4 Marks)**

Kiaria is 7 years older than Jay.  
Martha is twice as old as Kiaria.  
The sum of their three ages is 77

Find the ratio of Jay's age to Kiaria's age to Martha's age.

**Question 3 (3 Marks)**

The area of square  $ABCD$  is  $10 \text{ cm}^2$ .

Show that  $x^2 + 6x = 1$

**Question 4 (4 Marks)**

A shop sells packs of black pens, packs of red pens and packs of green pens.

There are

2 pens in each pack of black pens

5 pens in each pack of red pens

6 pens in each pack of green pens

On Monday,

$$\text{number of packs of black pens sold} : \text{number of packs of red pens sold} : \text{number of packs of green pens sold} = 7:3:4$$

A total of 212 pens were sold.

Work out the number of green pens sold.