

Area and Perimeter of Compound Shapes with Circles

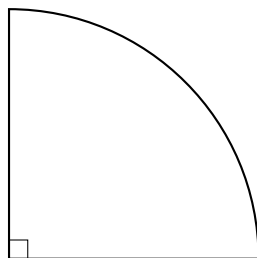
For AQA GCSE Mathematics (8300) • Higher tier

Name _____

Total marks: **33**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. You may use a calculator. Diagrams are not drawn accurately.

- 1 Here is a quarter circle.
The area of the quarter circle is $16\pi \text{ cm}^2$.



Not drawn accurately

- (a) Work out the radius of the quarter circle.

[2 marks]

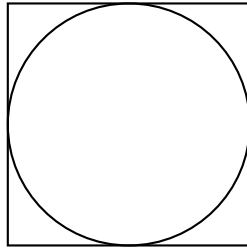
Answer _____ cm

- (b) Work out the perimeter of the quarter circle.
Give your answer in the form $a + b\pi$ where a and b are integers.

[2 marks]

Answer _____ cm

- 2 A circle fits exactly inside a square.
The circle touches all four sides of the square.



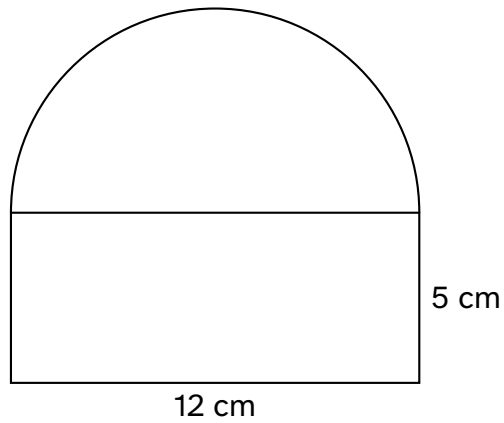
Not drawn accurately

The area of the circle is $49\pi \text{ cm}^2$.
Work out the perimeter of the square.

[3 marks]

Answer _____ cm

- 3** The shape is made from a rectangle and a semicircle.



Not drawn accurately

- (a) Work out the area of the shape.
Give your answer to 3 significant figures.

[3 marks]

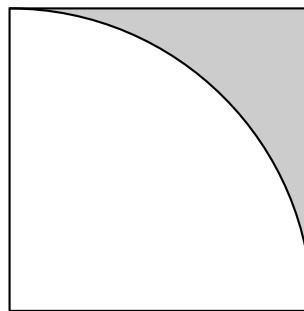
Answer _____ cm^2

- (b) Work out the perimeter of the shape.
Give your answer to 3 significant figures.

[3 marks]

Answer _____ cm

- 4 The diagram shows a square of side $2x$ cm.
A quarter circle of radius $2x$ cm is drawn inside the square, with its centre at one corner of the square.
The shaded area is 50 cm^2 .



$2x \text{ cm}$

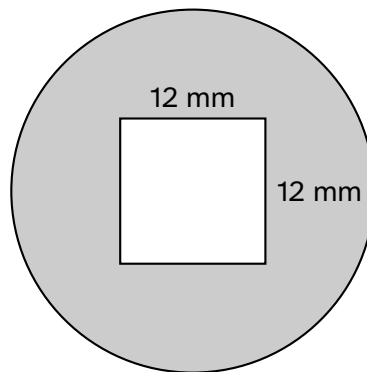
Not drawn accurately

Work out the value of x .
Give your answer to 3 significant figures.

[4 marks]

$x =$ _____

- 5 A square hole is cut from the centre of a circular metal disc.
The diameter of the disc is 30 mm.
The hole is a square with sides of length 12 mm.



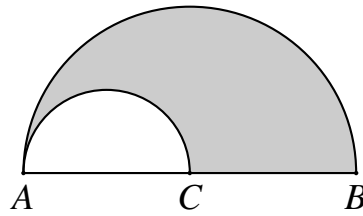
Not drawn accurately

Work out the area of the hole as a percentage of the area of the disc.
Give your answer to 1 decimal place.

[4 marks]

Answer _____ %

- 6 The diagram shows two semicircles.
 AB is the diameter of the large semicircle.
 AC is the diameter of the small semicircle.
 C is the midpoint of AB .
The area of the shaded region is $24\pi \text{ cm}^2$.



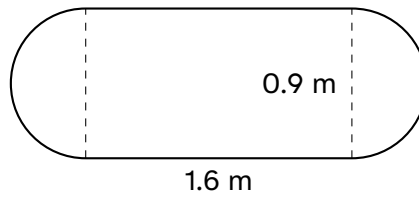
Not drawn accurately

Work out the perimeter of the shaded region.
Give your answer in the form $a\pi + b$ where a and b are integers.

[5 marks]

Answer _____ cm

- 7 A table top is a rectangle with a semicircle at each end.
The straight edges are each 1.6 m long.
The table top is 0.9 m wide.



Not drawn accurately

- (a) A strip of trim is fixed all the way round the edge of the table top.
The trim is sold in rolls.
Each roll is 2.5 m long.
How many rolls of trim are needed?
You must show your working.

[3 marks]

Answer _____

- (b) A smaller table top is also a rectangle with a semicircle at each end.
It is 0.9 m wide.
The total perimeter of the smaller table top is 5.5 m.
Work out the area of the smaller table top.
Give your answer to 3 significant figures.

[4 marks]

Answer _____ m²