FluidMaths

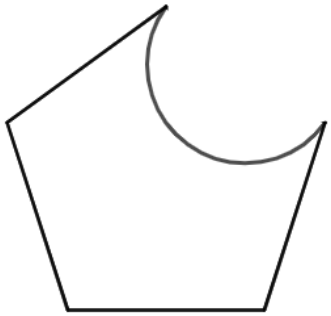
GCSE Mathematics (Grade 9-1)

Problem Solving
Area of a Circle Set 2 – Questions

Some useful strategies in problem-solving

- Read the question carefully
- Sketch a diagram where applicable
- Take note of key information
- Write down any formulae you may need
- Tackle the problem in bite-size rather than as a whole
- Concentrate on the part of the problem you understand and start from there
- Collaborate with a partner and share ideas
- Use a dictionary to find the meaning of any confusing words
- Check that your answers make sense in the context of the question

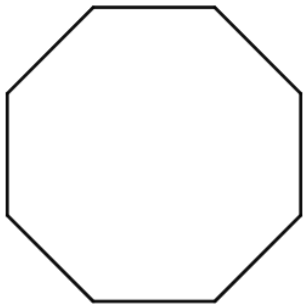
1 A semi-circle is removed from one side of a regular pentagon as shown below



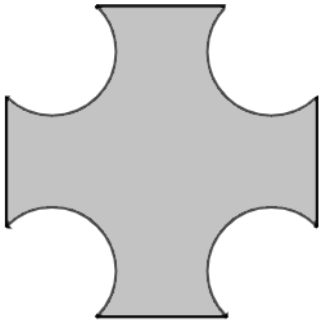
If the area of the semi-circular is 25 cm^2,
find the perimeter of the shape
Give your answer to 3 significant figures.

[4marks]

2 A regular octagon is shown below

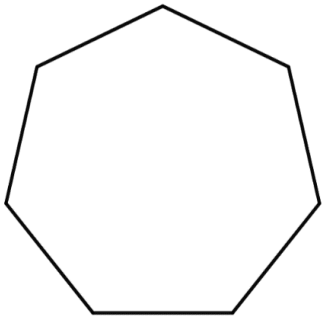


The area of the octagon is 150 cm^2
The perimeter of the octagon is 48 cm
Four identical semi-circles have been removed from the octagon to form the new shape below

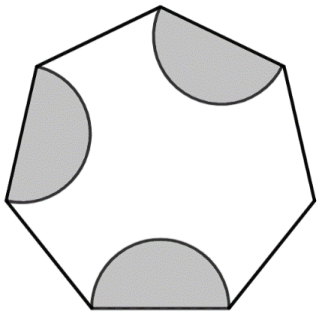


Calculate the area of the new shape.
Give your answer in terms of π **[4marks]**

3 Here is a regular heptagon

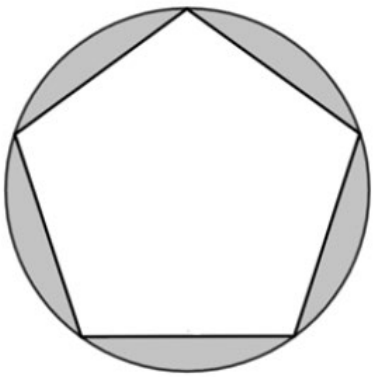


The perimeter of the heptagon is 70 cm
Three semi-circles are drawn inside the heptagon as shown



30% of the heptagon is shaded
What is the area of the heptagon?
Give your answer in terms of pi. **[5marks]**

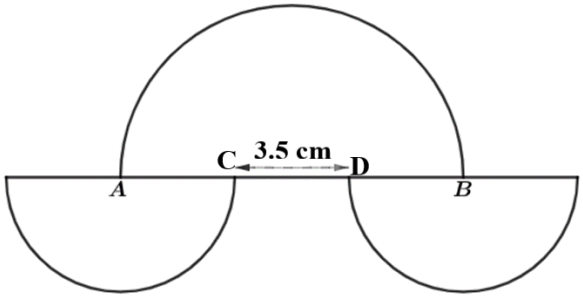
4 A regular pentagon is drawn inside a circle as shown



The pentagon and the circle have the same centre
The radius of the circle is 5.1 cm
Calculate the size of the shaded area
Give your answer to 3 significant figures

[5marks]

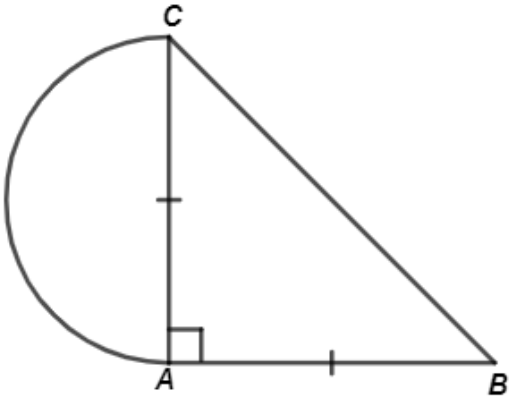
5 Two identical semi-circles have their centers at points A and B as shown in the diagram below.



CD = 3.5 cm
AB is the diameter of the larger semi-circle
The area of the larger semi-circle is 32π cm^2.
Calculate the perimeter of the shape in terms of π.

[5marks]

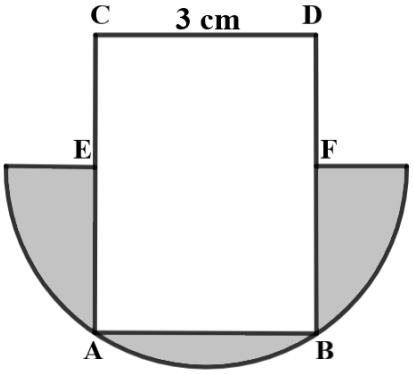
6 ABC is an isosceles triangle



AB = AC
A semi-circle is drawn to the side AC
The area of the semi-circle is 32π cm^2
Show that the area of triangle ABC is 128 cm^2

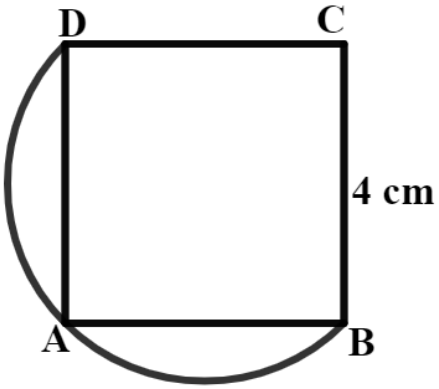
[4marks]

7 Rectangle ABCD is drawn inside a semi-circle as shown



The circumference of the semi-circle is 4π cm
CD = 3 cm
BC = 5 cm
$\frac{3}{4}$ of the rectangle is inside the semi-circle
Calculate the exact size of the shaded area. **[6marks]**

8 ABCD is a square of side 4 cm
A semi-circle is drawn to the square such that BD is the diameter of the semi-circle



Show that the perimeter of the shape can be written as $2\left(4+\pi\sqrt{2}\right)$ **[6marks]**