

Session 13: Areas and Perimeters

1

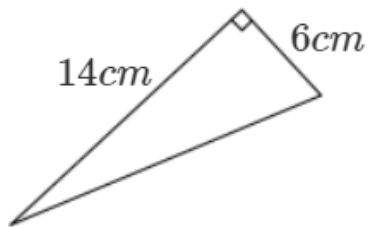


Diagram **NOT**
accurately drawn

Work out the area of the triangle.

(Total 2 marks)

2

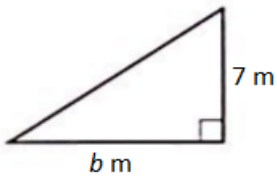


Diagram **NOT**
accurately drawn

The area of the triangle is $42m^2$.

Calculate the value of b.

(Total 2 marks)

3

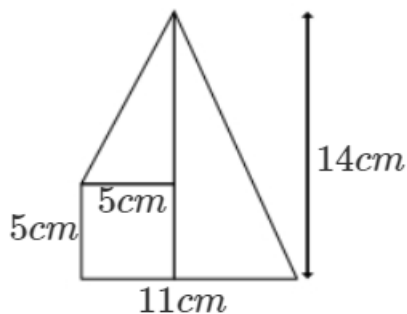


Diagram **NOT**
accurately drawn

Work out the area of the shape.

(Total 3 marks)

4

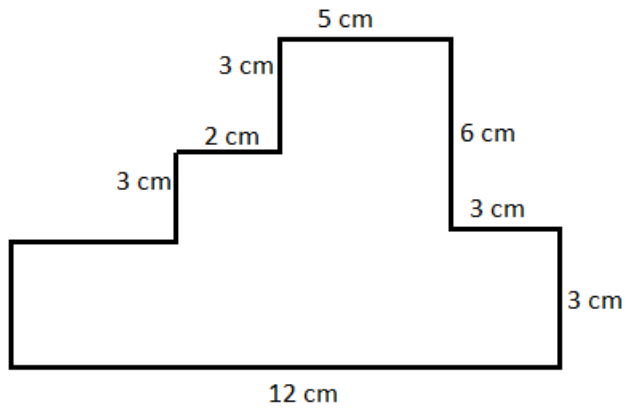


Diagram **NOT** accurately drawn

- a) Work out the perimeter of the shape. (2)
- b) Work out the area of the shape. (3)

(Total 5 marks)

- 5 A rectangle has perimeter 22cm and area 30 cm^2 what is the length and width?

(Total 3 marks)

6

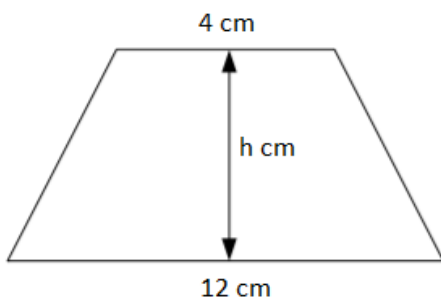


Diagram **NOT** accurately drawn

The area of the trapezium is 40 cm^2 .

Work out the value of h.

(Total 2 marks)

- 7 The area of this shape is 216 cm^2 .
Work out the value of x .

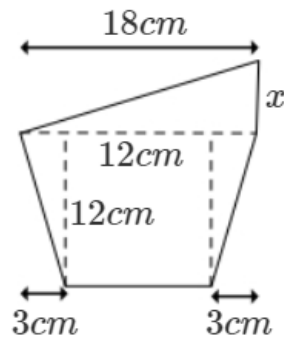
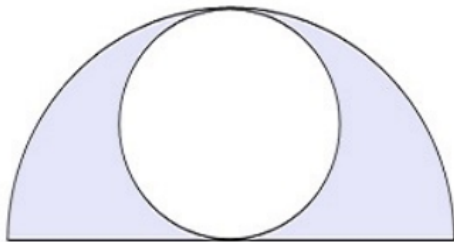


Diagram **NOT**
accurately drawn

(Total 4 marks)

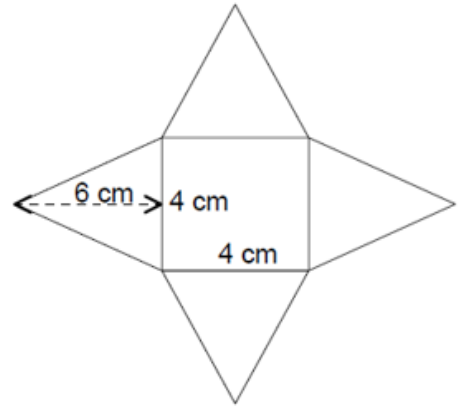
8



- The diagram shows a circle inside a semicircle.
The circle has a diameter of 12 cm .
The semicircle has a diameter of 24 cm .
Calculate the shaded area. Give your answer to 1 decimal place.

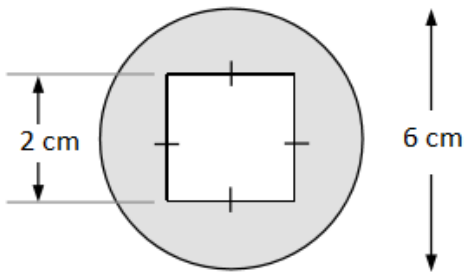
(Total 4 marks)

- 9 The shape is made by 4 identical triangles and a square.
Calculate the area of the shape.



(Total 4 marks)

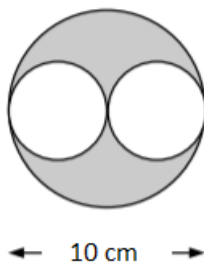
10



- A shape is made by cutting a square out of a circle. Work out the shape. Give your answer to 3 significant figures.

(Total 4 marks)

11



- Work out the shaded area. Give your answer to 2 decimal places.

(Total 4 marks)

12

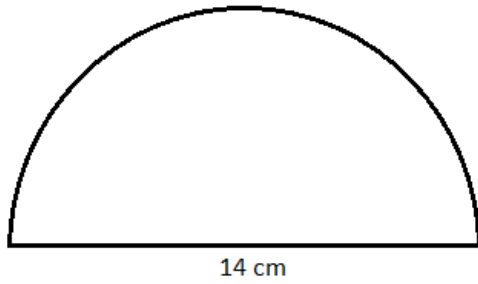


Diagram **NOT**
accurately drawn

The diameter of a semicircle is 14 cm.

Work out the perimeter of the semicircle. Give your answer to 3 significant figures.

(Total 4 marks)

13



Diagram not
accurately drawn

The diagram shows a rectangle and a square.

The rectangle is 12 cm long and 4 cm wide.

The perimeter of the rectangle is the same as the perimeter of the square.

Work out the length of one side of the square.

(Total 3 marks)

14

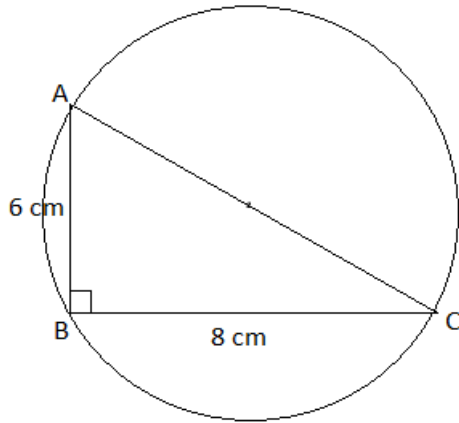


Diagram **not** accurately drawn

The diagram shows a right-angled triangle in a circle. AC is the diameter of the circle.

A, B and C are points on the circle. Calculate the following giving your answers to 1 decimal place:

- the circumference of the circle.
- the area of the circle.

(Total 6 marks)

15

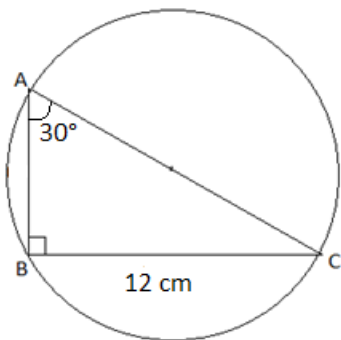


Diagram **not** accurately drawn

The diagram shows a right-angled triangle in a circle.

AC is the diameter of the circle.

A, B and C are points on the circle.

Calculate the following give your answers to 3 significant figures:

- the circumference of the circle.
- the area of the circle.

(Total 6 marks)

16

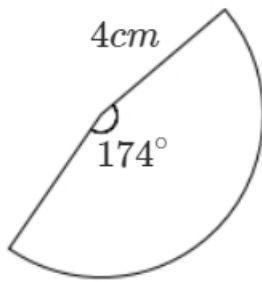


Diagram **not**
accurately drawn

The diagram shows a sector with radius = 4 cm.

Calculate the following giving your answers to 2 decimal places.

- a) the area of the sector.
- b) the perimeter of the shape.

(Total 5 marks)

17

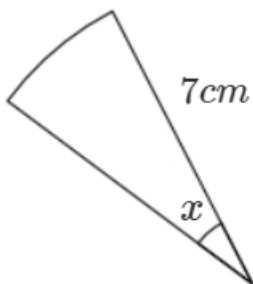


Diagram **not**
accurately drawn

The area of the sector is 13.68 cm^2 .

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

(Total 4 marks)

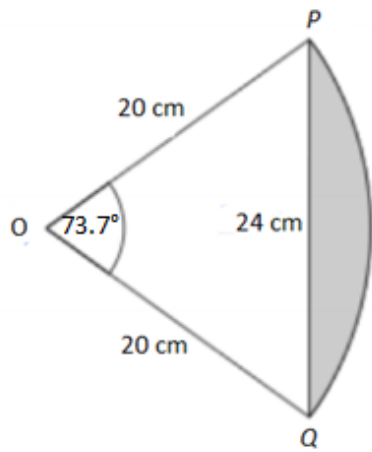


Diagram **not**
accurately drawn

The diagram shows a triangle OPQ and the arc PQ of a circle, centre is O and whose radius is 20 cm .

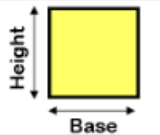
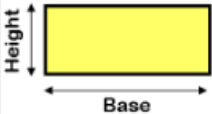
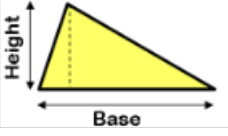
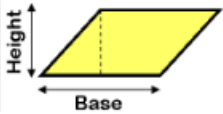
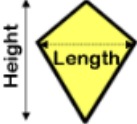
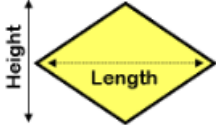
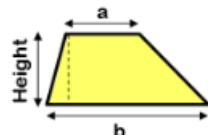
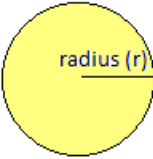
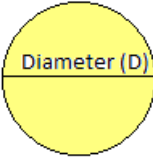
Calculate the following, giving all the answers to 3 significant figures:

- the length of the arc PQ .
- the area of the shaded segment.

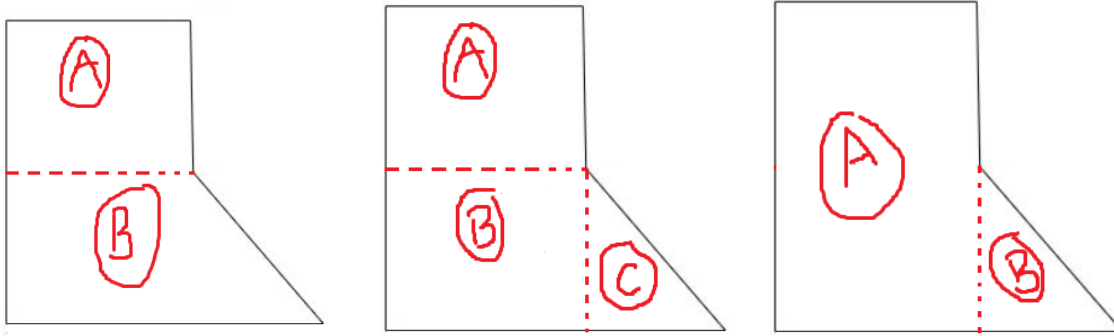
RECAP:

- Remember that the topics in maths are always linked!!

- Formulas for areas + circumference of a circle:

Shape	Name	Area
	Square	$base \times height$
	Rectangle	$base \times height$
	Triangle	$\frac{1}{2} \times base \times height$
	Parallelogram	$base \times perpendicular\ height$
	Kite	$length \times height \times \frac{1}{2}$
	Rhombus	$length \times height \times \frac{1}{2}$
	Trapezium	$\frac{(a + b)}{2} \times height$
	Circle	$Area = \pi \times r^2$
	Circle	$Circumference = \pi \times D$

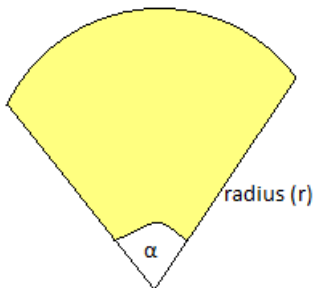
- To calculate the areas of compound shapes, you must split the shape into different ones. It does not matter the way you split it, as long as you have shapes where it is possible to use the formulas on the table above (example):



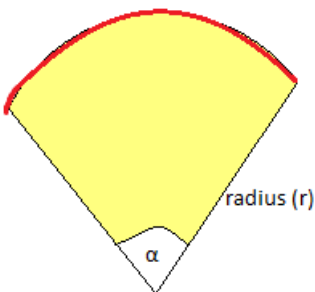
- To calculate the area shaded:

$$\text{Area shaded} = \text{Area outside shape} - \text{Area inside shape}$$

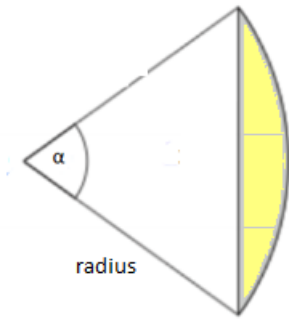
$$\text{Area of a sector} = \frac{\alpha}{360^\circ} \times \pi \times r^2$$



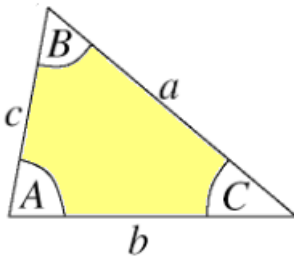
$$\text{Arc length of a sector} = \frac{\alpha}{360^\circ} \times \pi \times D \quad \text{or} \quad \frac{\alpha}{360^\circ} \times \pi \times 2r$$



- Area of a shaded segment = Area of the sector – Area of the triangle



Usually, this involves further trigonometry (because the triangle is not a right-angled triangle).



- Area of a triangle:

$$\text{Area} = \frac{1}{2} \times a \times b \times \sin(C)$$

Formulas for trigonometry:

$$\sin(x) = \frac{\text{opposite}}{\text{hypoteneuse}}$$

$$\cos(x) = \frac{\text{adjacent}}{\text{hypoteneuse}}$$

$$\tan(x) = \frac{\text{opposite}}{\text{adjacent}}$$