1 The diagram shows sector OPQ of a circle, centre O

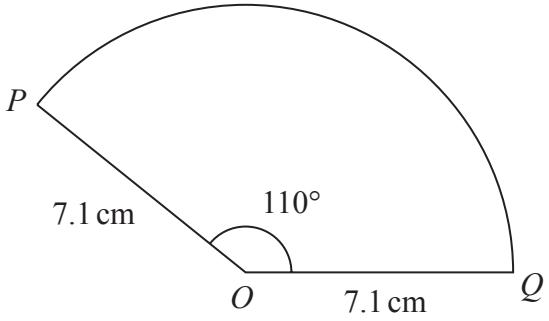


Diagram **NOT** accurately drawn

$OP = OQ = 7.1$ cm
Angle $POQ = 110°$

Calculate the area of sector OPQ
Give your answer correct to one decimal place.

..... cm^2

(Total for Question 1 is 2 marks)

2 The diagram shows a sector of a circle with radius 7 cm.

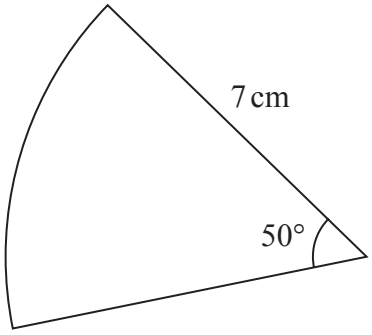


Diagram **NOT** accurately drawn

Work out the length of the arc of the sector.
Give your answer correct to one decimal place.

..... cm

(Total for Question 2 is 2 marks)

3 A circle centre O has radius 9 cm.

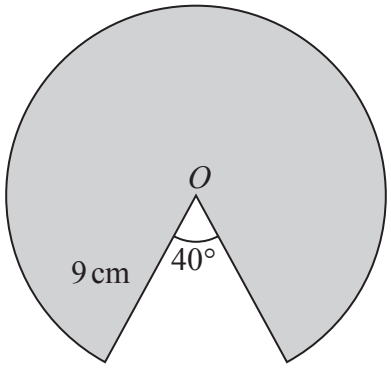


Diagram **NOT** accurately drawn

Calculate the perimeter of the shaded sector of the circle.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 3 is 4 marks)

4 The diagram shows a circle with centre O

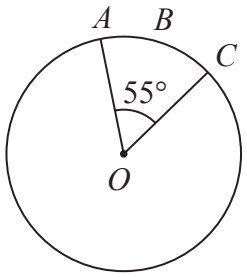


Diagram **NOT** accurately drawn

A, B and C are points on the circle so that the length of the arc ABC is 5 cm.

Given that angle $AOC = 55°$

work out the area of the circle.
Give your answer correct to one decimal place.

..... cm^2

(Total for Question 4 is 4 marks)

5 In the diagram, *ABC* is a right-angled triangle and *DEF* is a semicircular arc.

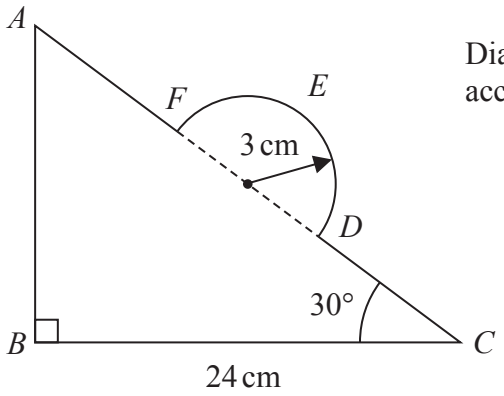


Diagram **NOT** accurately drawn

In triangle *ABC*

$BC = 24\,\text{cm}$ angle $ABC = 90°$ angle $BCA = 30°$

The points *D* and *F* lie on *AC* so that *DF* is the diameter of the semicircular arc *DEF*
The radius of the semicircular arc is 3 cm.

Work out the length of *AFEDC*
Give your answer correct to 2 significant figures.

..... cm

(Total for Question 9 is 5 marks)

6

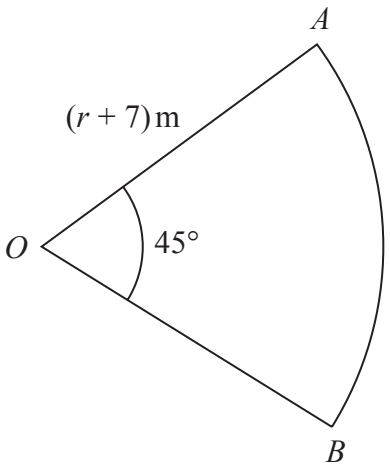


Diagram **NOT** accurately drawn

OAB is a sector **S** of a circle with centre *O* and radius $(r + 7)$ metres.
Angle *AOB* = 45°

A circle **C** has radius $(r - 2)$ metres.

The area of sector **S** is twice the area of circle **C**

Find the value of *r*
Show your working clearly.

$r =$ .....

(Total for Question 6 is 5 marks)

7 The diagram shows a sector $OAPB$ of a circle, centre O.

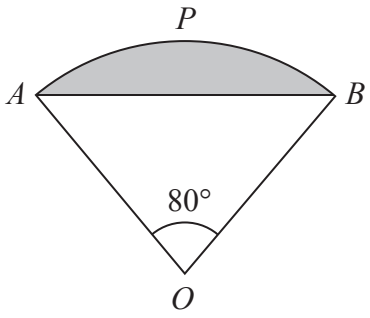


Diagram **NOT** accurately drawn

AB is a chord of the circle.
Angle $AOB = 80°$

The area of sector $OAPB$ is $\frac{25}{2}\pi \text{ cm}^2$

Work out the perimeter of the shaded segment.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 7 is 6 marks)

8

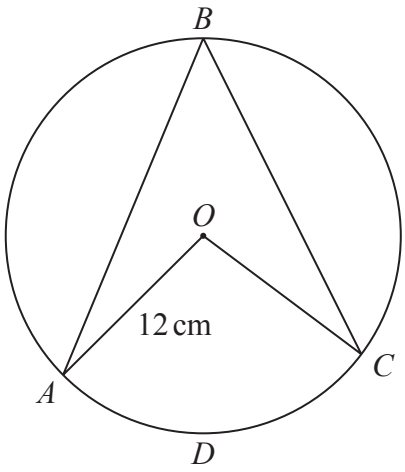


Diagram **NOT** accurately drawn

A, B, C and D are points on a circle with centre O and radius 12 cm.

The area of the sector $OADC$ of the circle is 100 cm^2

Work out the size of angle ABC.
Give your answer correct to 3 significant figures.

.....°

(Total for Question 8 is 4 marks)

9 The diagram shows a sector OBC of a circle with centre O and radius $(6 + x)$ cm.

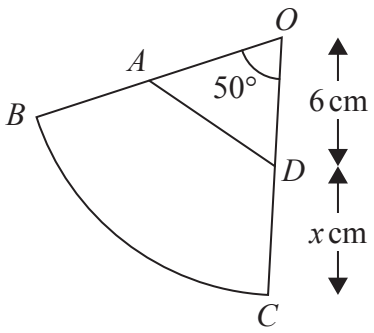


Diagram **NOT** accurately drawn

A is the point on OB and D is the point on OC such that $OA = OD = 6$ cm

Angle $BOC = 50°$

Given that

the perimeter of sector $OBC = 2 \times$ the perimeter of triangle OAD

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

$x =$ .....

(Total for Question 9 is 6 marks)

10

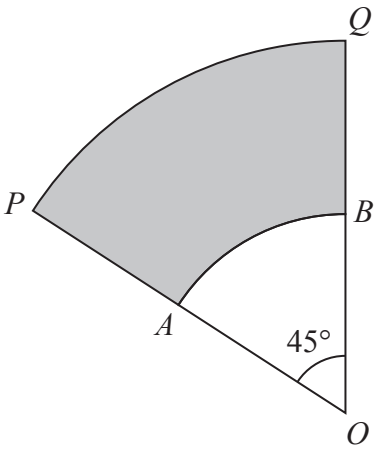


Diagram **NOT** accurately drawn

OPQ is a sector of a circle, centre *O*
OAB is a sector of a circle, centre *O*

A is the point on *OP* such that $OA : AP = 3 : 2$
B is the point on *OQ* such that $OB : BQ = 3 : 2$
Angle $POQ = 45°$

The area of the shaded region is $\frac{81}{2}\pi$ cm^2

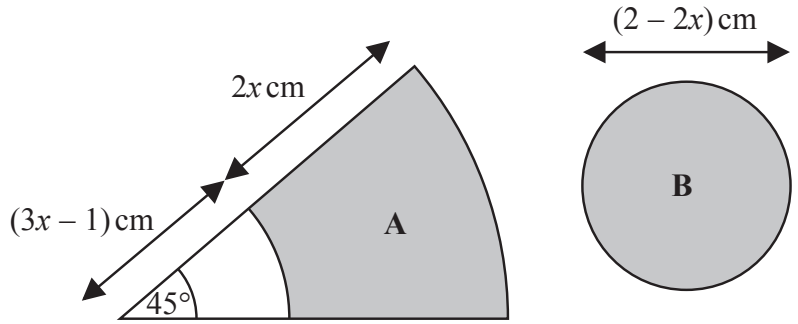
Work out the perimeter of the shaded region.
Give your answer in terms of π.

cm

(Total for Question 10 is 6 marks)

11 The diagram shows two shaded shapes, **A** and **B**.

Shape **A** is formed by removing a sector of a circle with radius $(3x - 1)$ cm from a sector of the circle with radius $(5x - 1)$ cm.
Shape **B** is a circle of diameter $(2 - 2x)$ cm.



The area of shape **A** is equal to the area of shape **B**.

Find the value of x.
You must show all your working.

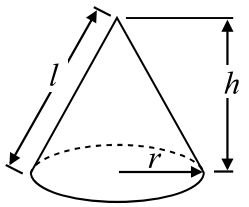
(Total for Question 11 is 5 marks)

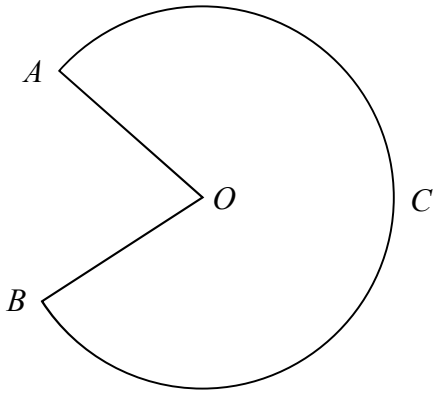
12 The diagram shows a sector $OACB$ of a circle with centre O.
The point C is the midpoint of the arc AB.

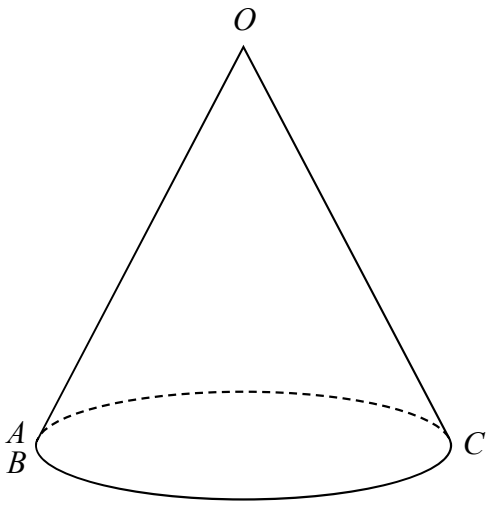
The diagram also shows a hollow cone with vertex O.
The cone is formed by joining OA and OB.

Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = πrl







The cone has volume 56.8 cm^3 and height 3.6 cm.

Calculate the size of angle AOB of sector $OACB$.
Give your answer correct to 3 significant figures.
You must show all your working.

°

.....

(Total for Question 12 is 5 marks)

13 Here is a sector, AOB, of a circle with centre O and angle $AOB = x°$

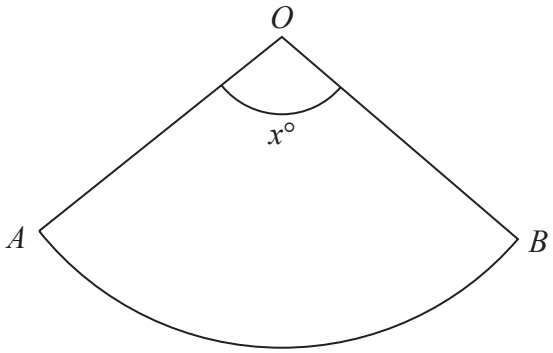


Diagram **NOT** accurately drawn

The sector can form the curved surface of a cone by joining OA to OB.

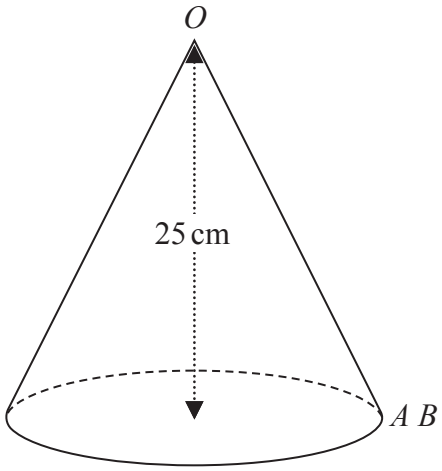


Diagram **NOT** accurately drawn

The height of the cone is 25 cm.
The volume of the cone is 1600 cm^3

Work out the value of x.
Give your answer correct to the nearest whole number.

$x =$ .....

(Total for Question 13 is 6 marks)