

# Circle Problems

## (Area, Circumference, Arcs)

### Question Paper 3

Level	IGCSE
Subject	Maths (0580)
Exam Board	Cambridge International Examinations (CIE)
Paper Type	Extended
Topic	Mensuration (Perimeters, Areas & Volumes)
Sub-Topic	Circle Problems (Area, Circumference, Arcs)
Booklet	Question Paper 3

**Time Allowed:** 47 minutes

**Score:** /39

**Percentage:** /100

**Grade Boundaries:**

A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

1 A circle has a radius of 50 cm.

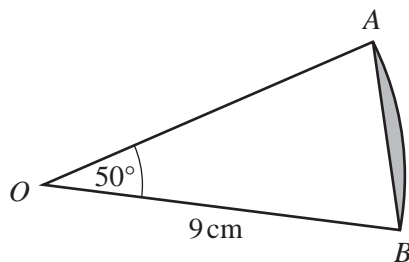
(a) Calculate the area of the circle in  $\text{cm}^2$ .

Answer(a) .....  $\text{cm}^2$  [2]

(b) Write your answer to **part (a)** in  $\text{m}^2$ .

Answer(b) .....  $\text{m}^2$  [1]

2



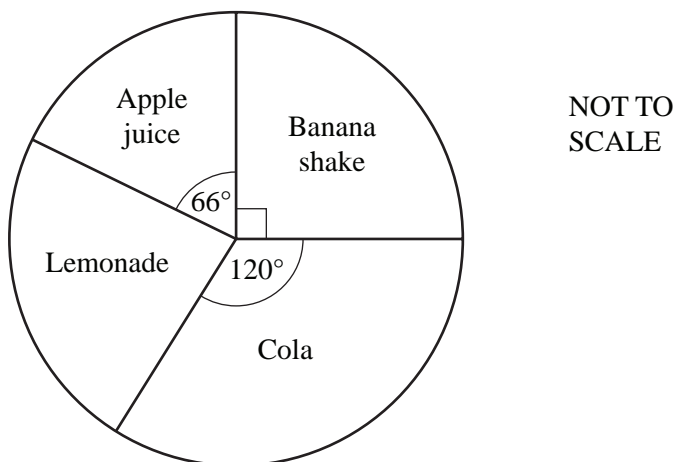
NOT TO  
SCALE

The diagram shows a sector  $AOB$  of a circle, centre  $O$ , radius 9 cm with angle  $AOB = 50^\circ$ .

Calculate the area of the segment shaded in the diagram.

Answer .....  $\text{cm}^2$  [4]

- 3 60 students recorded their favourite drink.  
The results are shown in the pie chart.



- (a) Calculate the angle for the sector labelled Lemonade.

Answer(a) ..... [1]

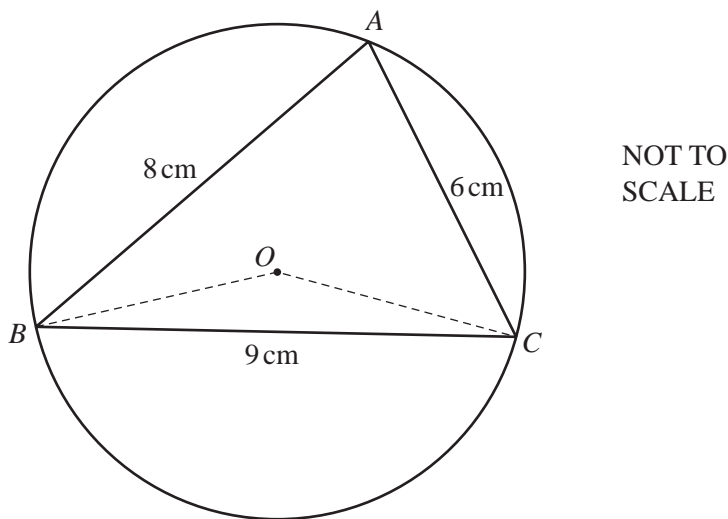
- (b) Calculate the number of students who chose Banana shake.

Answer(b) ..... [1]

- (c) The pie chart has a radius of 3 cm.  
Calculate the arc length of the sector representing Cola.

Answer(c) ..... cm [2]

4



The circle, centre  $O$ , passes through the points  $A$ ,  $B$  and  $C$ .

In the triangle  $ABC$ ,  $AB = 8$  cm,  $BC = 9$  cm and  $CA = 6$  cm.

(a) Calculate angle  $BAC$  and show that it rounds to  $78.6^\circ$ , correct to 1 decimal place.

*Answer(a)*

[4]

(b)  $M$  is the midpoint of  $BC$ .

(i) Find angle  $BOM$ .

*Answer(b)(i)* Angle  $BOM = \dots\dots\dots$  [1]

- (ii) Calculate the radius of the circle and show that it rounds to 4.59 cm, correct to 3 significant figures.

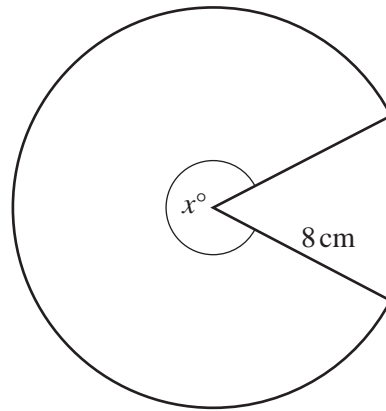
*Answer(b)(ii)*

[3]

- (c) Calculate the area of the triangle  $ABC$  as a percentage of the area of the circle.

*Answer(c)* ..... % [4]

5



NOT TO  
SCALE

The diagram shows a sector of a circle of radius 8 cm.  
The angle of the sector is  $x^\circ$ .  
The perimeter of the sector is  $(16 + 14\pi)$  cm.

Find the value of  $x$ .

Answer  $x =$  ..... [3]

6 A spacecraft made 58 376 orbits of the Earth and travelled a distance of  $2.656 \times 10^9$  kilometres.

(a) Calculate the distance travelled in 1 orbit correct to the nearest kilometre.

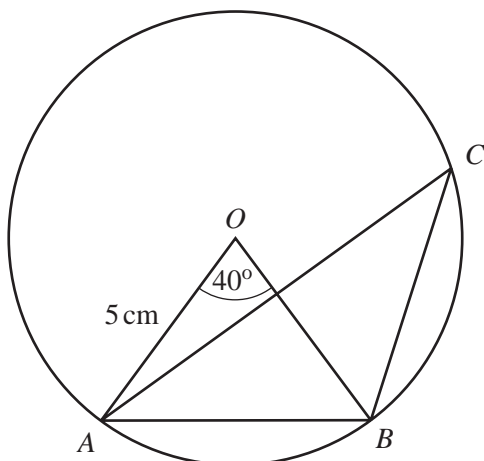
Answer(a) ..... km [2]

(b) The orbit of the spacecraft is a circle.

Calculate the radius of the orbit.

Answer(b) ..... km [2]

7



NOT TO SCALE

$A$ ,  $B$  and  $C$  are points on a circle, centre  $O$ .  
Angle  $AOB = 40^\circ$ .

(a) (i) Write down the size of angle  $ACB$ .

Answer (a)(i) Angle  $ACB = \dots\dots\dots$  [1]

(ii) Find the size of angle  $OAB$ .

Answer (a)(ii) Angle  $OAB = \dots\dots\dots$  [1]

(b) The radius of the circle is 5 cm.

(i) Calculate the length of the minor arc  $AB$ .

Answer (b)(i)  $\dots\dots\dots$  cm [2]

(ii) Calculate the area of the minor sector  $OAB$ .

Answer (b)(ii)  $\dots\dots\dots$   $\text{cm}^2$  [2]



- 8 The radius of the Earth at the equator is approximately  $6.4 \times 10^6$  metres.  
Calculate the circumference of the Earth at the equator. Give your answer in standard form, correct to 2 significant figures.

*Answer* .....m [3]