

# Circle Problems

## Difficulty: Hard

### Question Paper 1

Level	IGCSE
Subject	Maths (0580/0980)
Exam Board	CIE
Topic	Mensuration
Sub-Topic	Circle Problems
Paper	Paper 2
Difficulty	Hard
Booklet	Question Paper 1

**Time allowed:** 41 minutes

**Score:** /32

**Percentage:** /100

#### Grade Boundaries:

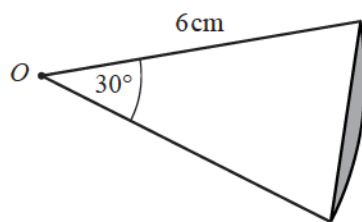
##### CIE IGCSE Maths (0580)

A*	A	B	C	D	E
>88%	76%	63%	51%	40%	30%

##### CIE IGCSE Maths (0980)

9	8	7	6	5	4	3
>94%	85%	77%	67%	57%	47%	35%

## Question 1



NOT TO  
SCALE

The diagram shows a sector of a circle, centre  $O$  and radius 6 cm.

The sector angle is  $30^\circ$ .

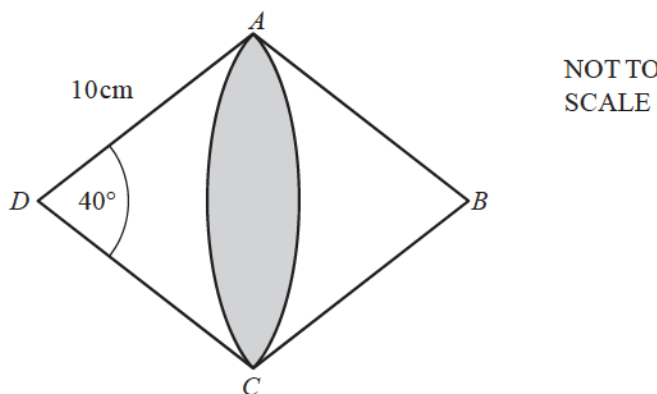
The area of the shaded segment is  $(kr - c)$  cm<sup>2</sup>, where  $k$  and  $c$  are integers.

Find the value of  $k$  and the value of  $c$ .

[3]

## Question 2

$ABCD$  is a rhombus with side length 10cm.



NOT TO  
SCALE

Angle  $ADC = 40^\circ$ .

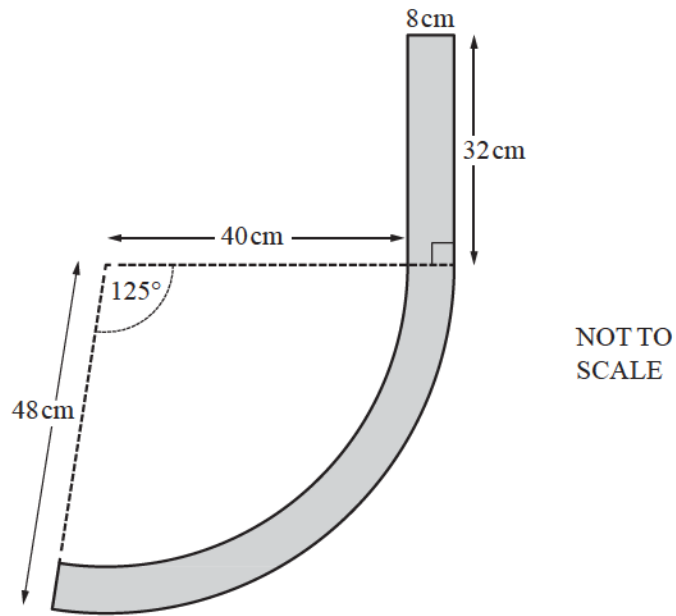
$DAC$  is a sector of a circle with centre  $D$ .

$BAC$  is a sector of a circle with centre  $B$ .

Calculate the shaded area.

[4]

### Question 3

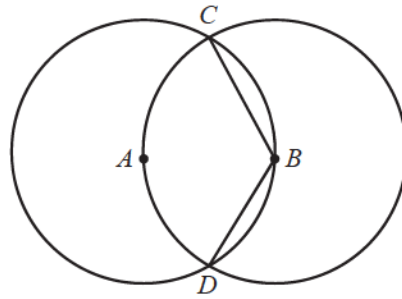


The diagram shows the cross section of part of a park bench.  
It is made from a rectangle of length 32 cm and width 8 cm and a curved section.  
The curved section is made from two concentric arcs with sector angle  $125^\circ$ .  
The inner arc has radius 40 cm and the outer arc has radius 48 cm.

Calculate the area of the cross section correct to the nearest square centimetre.

[5]

## Question 4

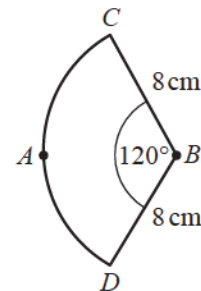


NOT TO SCALE

Two circles, centres  $A$  and  $B$ , are each of radius 8 cm and intersect at  $C$  and  $D$ . Each circle passes through the centre of the other circle.

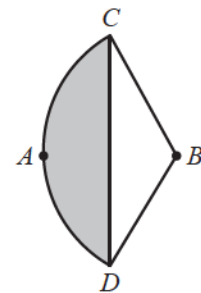
(a) Explain why angle  $CBD$  is  $120^\circ$ . [1]

(b) For the circle, centre  $B$ , find the area of the sector  $BCD$ .



NOT TO SCALE [2]

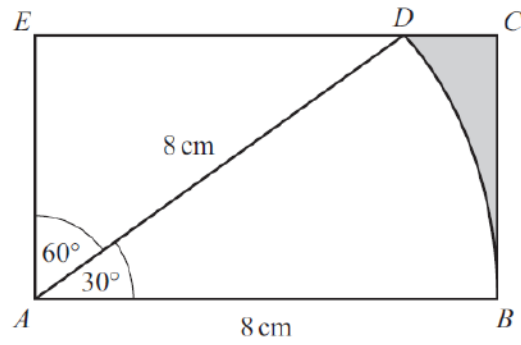
(c) (i) Find the area of the shaded segment  $CAD$ .



NOT TO SCALE [3]

(ii) Find the area of overlap of the two circles. [1]

### Question 5



NOT TO  
SCALE

The diagram shows a rectangle  $ABCE$ .

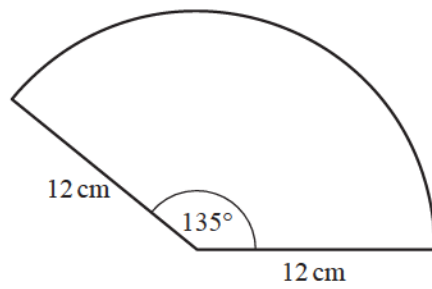
$D$  lies on  $EC$ .

$DAB$  is a sector of a circle radius  $8\text{ cm}$  and sector angle  $30^\circ$ .

Calculate the area of the shaded region.

[7]

## Question 6



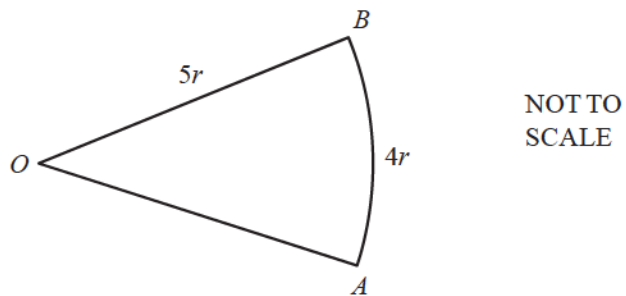
NOT TO  
SCALE

The diagram shows a sector of a circle of radius 12 cm with an angle of  $135^\circ$ .

Calculate the perimeter of the sector.

[3]

## Question 7



The diagram shows a sector of a circle, centre  $O$ , radius  $5r$ .  
The length of the arc  $AB$  is  $4r$ .

Find the area of the sector in terms of  $r$ , giving your answer in its simplest form.

[3]