



# Maths-it Podcast H-16

Higher GCSE Revision

## Circles

### Topics

Area and circumference – Length of arc – Area of sector and segment

### Questions

1.

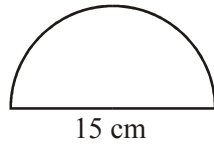


Diagram **NOT** accurately drawn

The diagram shows a semi-circle.  
The diameter of the semi-circle is 15 cm.

Calculate the perimeter of the semi-circle.  
Give your answer correct to 3 significant figures.

.....  
(Total 3 marks)

2. A circle has a radius of 7.8 cm.  
Work out the area of the circle.

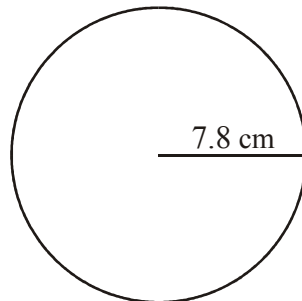
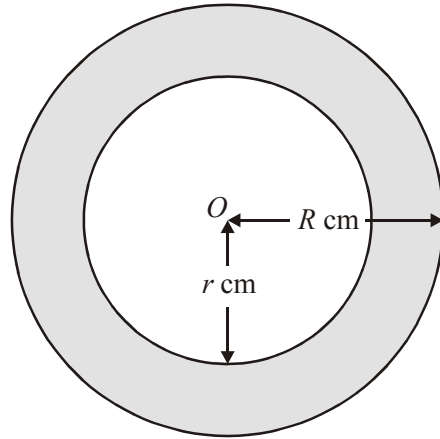


Diagram **NOT** accurately drawn

.....  
(Total 3 marks)

3. The diagram shows two circles.

Diagram **NOT** accurately drawn



$O$  is the centre of both circles.  
 The radius of the outer circle is  $R$  cm.  
 The radius of the inner circle is  $r$  cm.  
 $R = 6.1$  correct to 1 decimal place.  
 $r = 2.9$  correct to 1 decimal place.

(a) John says that the maximum possible diameter of the outer circle is 12.25 cm. Explain why John is wrong.

.....  
 .....  
 .....

(2)

The upper bound for the area, in  $\text{cm}^2$ , of the shaded region is  $k\pi$ .

(b) Find the **exact** value of  $k$ .

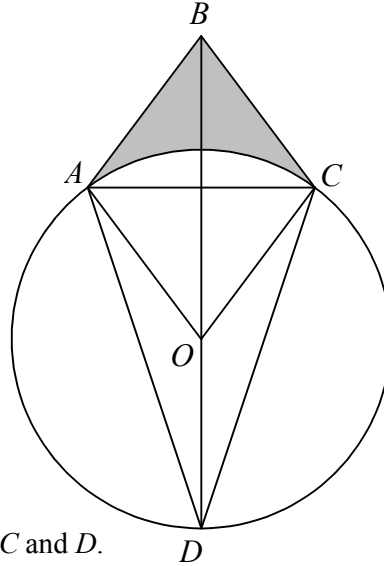
$k = \dots\dots\dots$

(4)

(Total 6 marks)

4. The diagram shows part of a pattern on a stained glass window.

Diagram NOT accurately drawn



$ABCO$  is a rhombus.  
 $ABCD$  is a kite.  
 $BE$  is a diagonal of  $ABCD$ .  
 $O$  is the centre of the circle passing through  $A$ ,  $C$  and  $D$ .

$AB = 12$  cm.  
 Angle  $ABC = 60^\circ$ .

- (a) Calculate the size of angle  $ADC$ .

.....<sup>o</sup> (1)

- (b) Calculate the size of angle  $AOD$ .

.....<sup>o</sup> (1)

- (c) Calculate the length of the arc  $AC$ .  
Give your answer correct to 3 significant figures.

..... cm (4)



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(d) (i) Calculate the area of triangle  $OAC$ .

.....  $\text{cm}^2$

(ii) Hence find the area of  $ABCO$ .

.....  $\text{cm}^2$

(c) Calculate the shaded area.  
Give your answer correct to 3 significant figures.

(4)

..... m

(3)

(Total 13 marks)