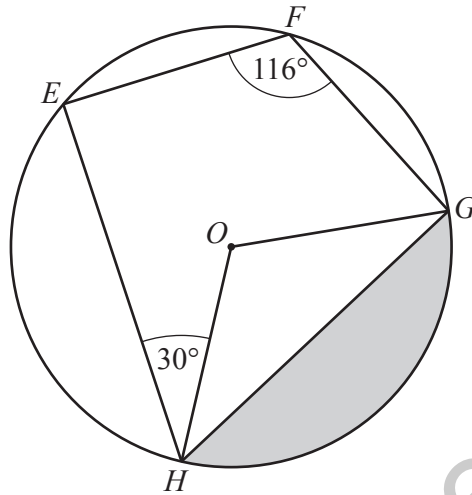


Name:

Section:

Arc length & Area of Sector worksheet

1



NOT TO
SCALE

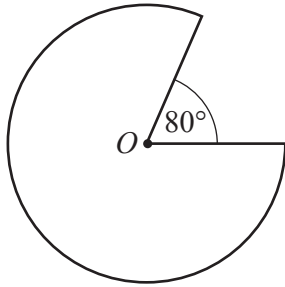
E , F , G and H are points on a circle with centre O and radius 6 cm.
 $\angle EHO = 30^\circ$ and $\angle EFG = 116^\circ$.

Calculate the shaded area.

Mega Lecture

..... cm^2 [5]

2



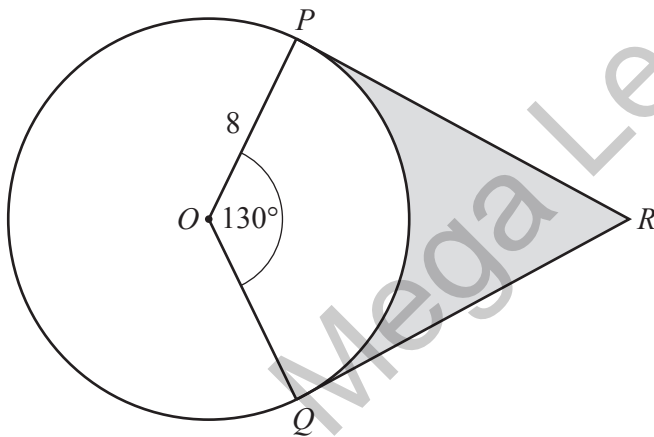
NOT TO SCALE

The diagram shows the major sector of a circle with centre O and radius 3 cm.

Calculate the area of this sector.

Give your answer in the form $k\pi$, where k is an integer.

3



NOT TO SCALE

..... cm² [2]

P and Q are points on the circumference of a different circle, centre O .

PR and QR are tangents to the circle at P and Q respectively.

$OP = 8$ cm and $\hat{POQ} = 130^\circ$.

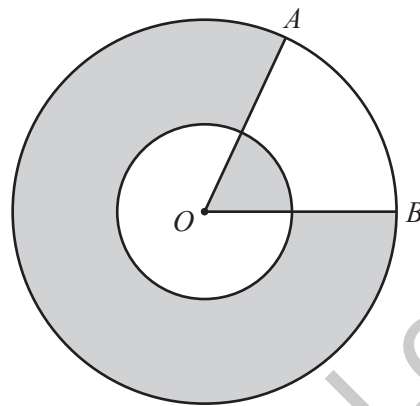
(i) Find PR .

$PR =$ cm [2]

(ii) Calculate the percentage of quadrilateral $OPRQ$ that is shaded.

4

..... % [4]



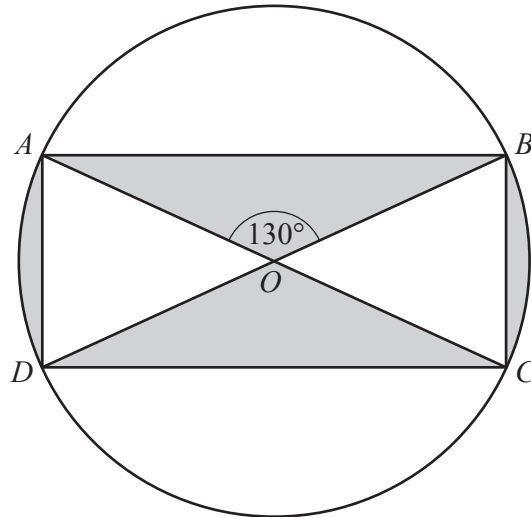
NOT TO SCALE

The diagram shows two circles, both with centre O .
 The radius of the small circle is 3 cm and the radius of the large circle is 6 cm.
 The minor sector AOB has an angle of 60° .

The total area of the shaded regions is $k\pi \text{ cm}^2$.

Find the value of k .

$k =$ [4]



AC and BD are diameters of the circle, centre O .
 $AC = 12$ cm and $\widehat{AOB} = 130^\circ$.

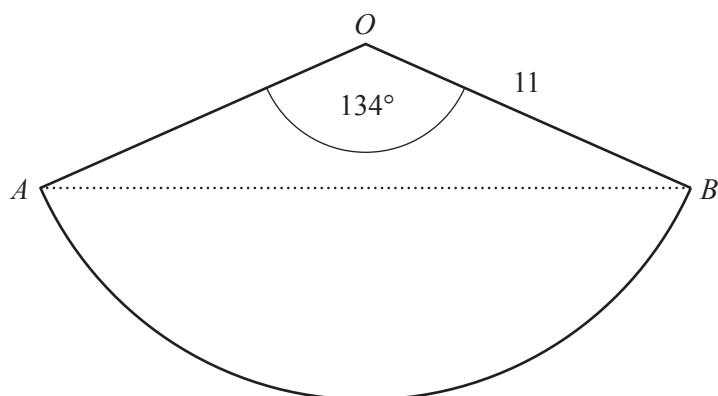
(a) Calculate the area of triangle AOB .

Answer cm^2 [2]

(b) Calculate the area of the sector AOD .

Answer cm^2 [2]

6 (a)



OAB is a sector of a circle, centre O , radius 11 cm.
 $\widehat{AOB} = 134^\circ$.

(i) Calculate the length of the arc AB .

Answer cm [2]

(ii) Calculate the shortest distance from O to the line AB .

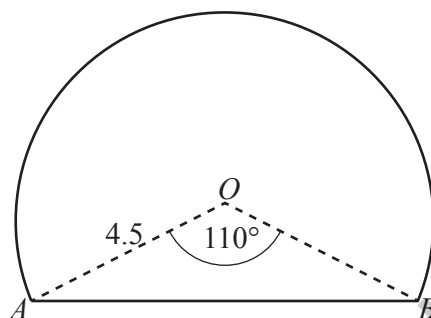
Answer cm [2]

- 7 (a) The ventilation shaft for a tunnel is in the shape of a cylinder. The cylinder has radius 0.4 m and length 15 m.

Calculate the volume of the cylinder.

Answer m³ [2]

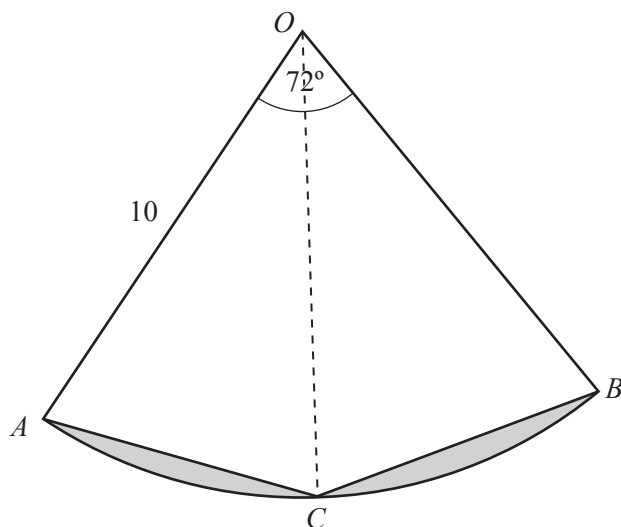
- (b) The diagram shows the cross-section of the tunnel.



The cross-section of the tunnel is a major segment of a circle, centre O . The radius of the circle is 4.5 m and $\hat{AOB} = 110^\circ$.

Calculate the area of the cross-section of the tunnel.

Answer m² [4]



OAB is a sector of a circle, centre O , and radius 10 cm.

$\hat{AOB} = 72^\circ$ and C is the point on the arc AB such that OC bisects \hat{AOB} .

(a) Calculate the perimeter of sector OAB .

..... cm [3]

(b) (i) Calculate the area of sector OAB .

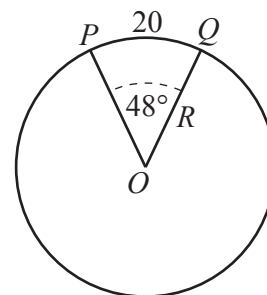
..... cm^2 [2]

(ii) Calculate the total shaded area.

..... cm^2 [3]

- 9 (a) P and Q are points on the circumference of a circle, centre O , radius R cm.
The minor arc $PQ = 20$ cm and $\widehat{POQ} = 48^\circ$.

- (i) Show that $R = 23.9$, correct to one decimal place.

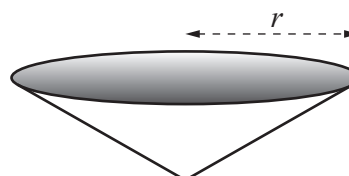
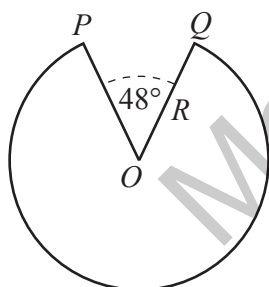


[3]

- (ii) Calculate the area of the minor sector POQ .

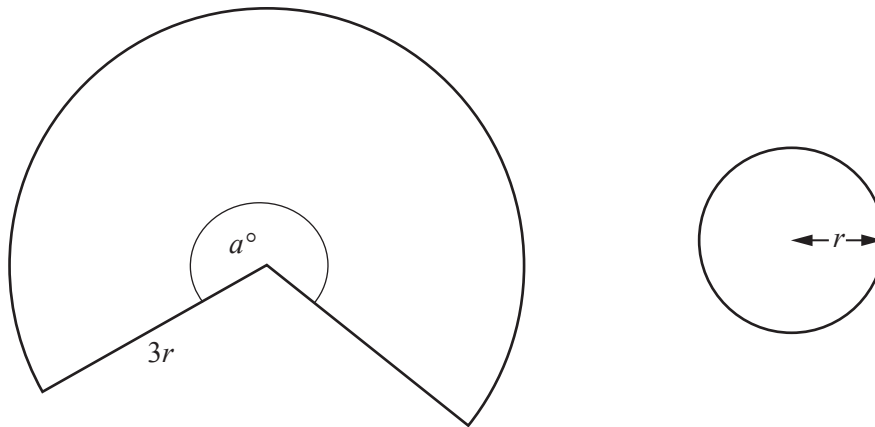
Answer cm^2 [2]

- (iii) The minor sector POQ is removed from the circle and the remaining major sector is shaped to form an open cone of radius r cm.



Calculate r .

Answer $r =$ [2]



The diagram shows a sector of a circle with radius $3r$ cm and angle a° and a circle with radius r cm.

The ratio of the area of the sector to the area of the circle with radius r cm is $8 : 1$.

(a) Find the value of a .

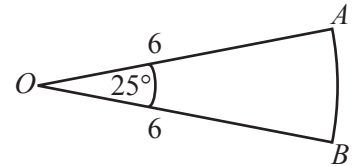
Answer $a = \dots\dots\dots$ [3]

(b) Find an expression, in terms of π and r , for the perimeter of the sector.

Answer $\dots\dots\dots$ cm [2]

11 (a) OAB is a sector of a circle, centre O , radius 6 cm.

$\widehat{AOB} = 25^\circ$.



(i) Calculate the length of the arc AB .

Answer cm [2]

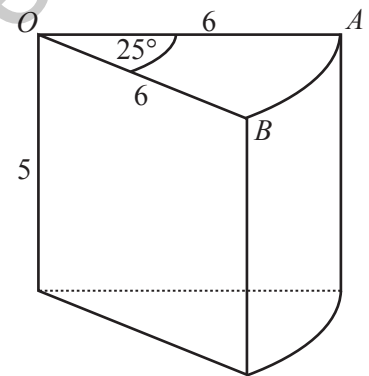
(ii) Calculate the area of the sector OAB .

Answer cm^2 [2]

(b) The sector OAB from part (a) is the cross-section of a slice of cheese.

The slice has a height of 5 cm.

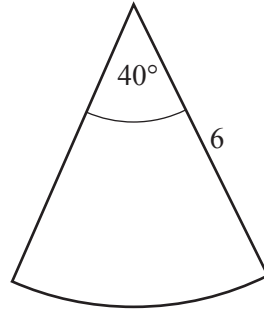
(i) Calculate the volume of this slice of cheese.



Answer cm^3 [1]

(ii) Calculate the total surface area of this slice of cheese.

Answer cm^2 [3]



The angle of a sector of a circle, radius 6 cm, is 40° .

- (i) The area of the sector is $k\pi \text{ cm}^2$.

Find the value of k .

Answer [2]

- (ii) Find an expression, in terms of π , for the perimeter of the sector.
Give your answer in the form $(a + b\pi)$ centimetres.

Answer cm [2]

- (iii) A geometrically similar sector has perimeter $(72 + n\pi)$ centimetres.

Find the value of n .

Answer [1]

13



A hollow cone has a base radius 6 cm and slant height 10 cm.
The curved surface of the cone is cut, and opened out into the shape of a sector of a circle, with angle x° and radius r cm.

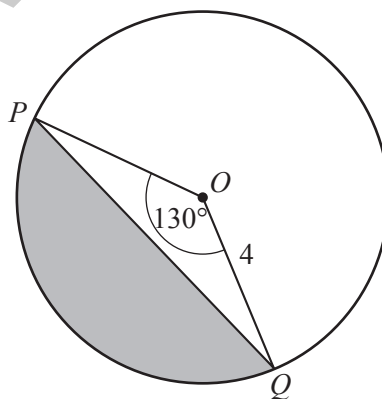
(a) Write down the value of r .

Answer $r = \dots\dots\dots$ [1]

(b) Calculate x .

Answer $x = \dots\dots\dots$ [2]

14 P and Q are points on the circle centre O with radius 4 cm.
 $\angle POQ = 130^\circ$.



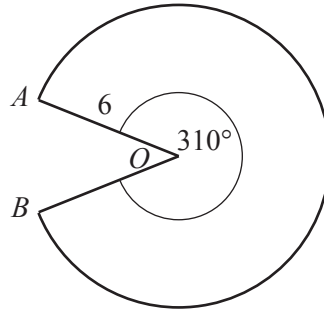
(i) Calculate the area of triangle POQ .

Answer $\dots\dots\dots$ cm² [2]

(ii) Calculate the area of the major segment, shown **unshaded** in the diagram.

Answer cm² [3]

15



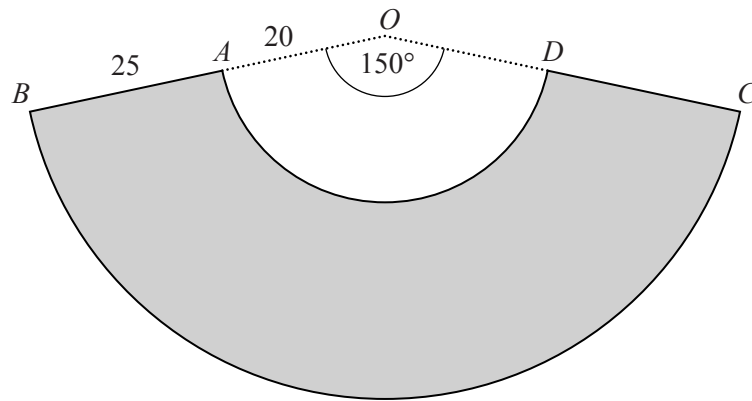
The diagram shows a sector AOB of a circle with centre O and radius 6 cm. The angle of the sector is 310° .

(a) Calculate the total perimeter of the sector.

Answer cm [3]

(b) Calculate the area of the sector.

Answer cm² [2]
<http://youtube.com/MegaLecture>
Megalecture@gmail.com



AD and BC are arcs of circles with centre O .
 A is a point on OB , and D is a point on OC .
 $OA = 20$ cm and $AB = 25$ cm.
 $\angle AOD = 150^\circ$.

- (a) Calculate the perimeter of the shaded shape $ABCD$.

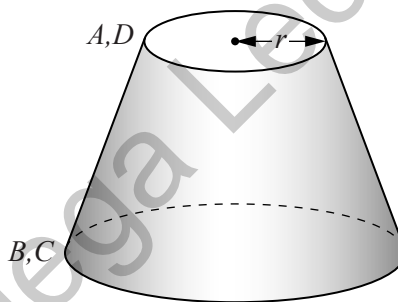
Mega Lecture

..... cm [3]

(b) Calculate the area of the shaded shape $ABCD$.

..... cm^2 [3]

(c) The shape $ABCD$ is used to make a lampshade by joining AB and DC .



Calculate the radius, r cm, of the circular top of the lampshade.

Answer cm [2]