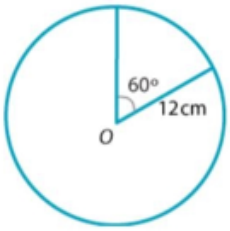
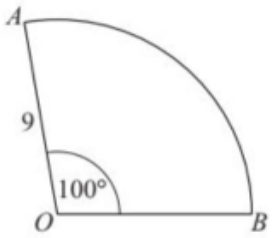
Past Papers Worksheet P2 Arc Length and Sector Area IGCSE Mathematics 0580

1. A sector has angle $60°$ and radius of 12cm.



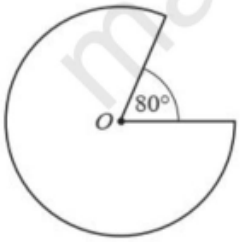
By taking $\pi = 3.14$ calculate length of minor arc .
[2]
4024/11/O/N/15 Q25(b)(ii)

2. The diagram shows a sector of a circle, centre O.



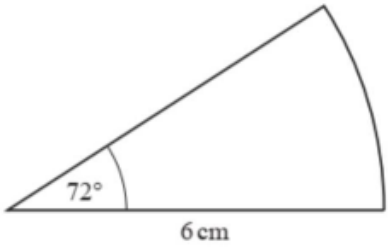
The radius of the circle is 9 cm and the sector angle is 100°.
Taking the value of π to be 3.14, calculate
(a)the length of the arc AB, [2]
(b) the perimeter of the sector. [1]
4024/11/O/N/10 Q15

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



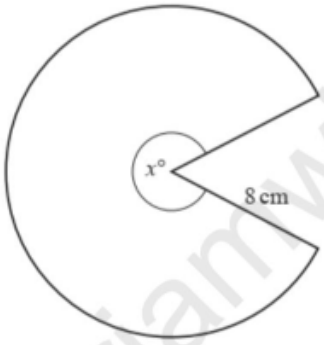
Calculate the area of this sector.
Give your answer in the form $k\pi$, where k is an integer. [2]
4024/12/M/J/22 Q23)

4. The diagram shows a sector of a circle with radius



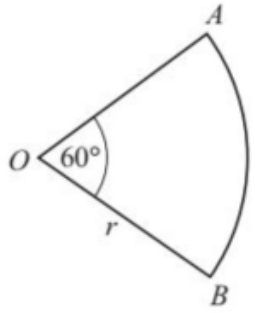
6cm and sector angle 72°.
The perimeter of this sector is (p + qπ) cm.
Find the value of p and the value of q. [3]
0580/23/O/N/18 Q19)

5. The diagram shows a sector of a circle of radius 8



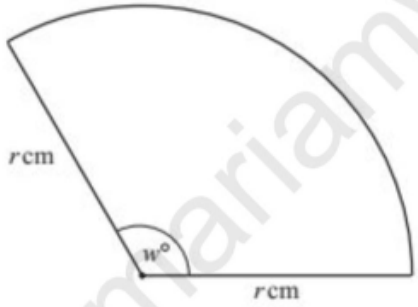
cm.
The angle of the sector is $x°$.
The perimeter of the sector is (16 + 14π) cm.
Find the value of x [3]
0580/23/O/N/10 Q18)

6. OAB is the sector of a circle of radius r cm.
   $A\hat{O}B = 60°$.
   Find, in its simplest form, an expression in terms of r and π for
   (a) the area of the sector, [1]
   (b) the perimeter of the sector. [2]



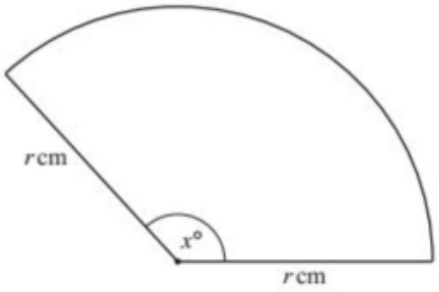
4024/12/M/J/10 Q18)

7. (a) The area of this sector is r^2 square centimetres.



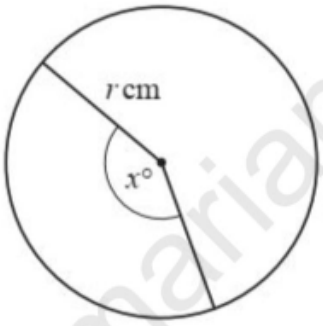
Find the value of w. [3]

(b) The perimeter of this sector is $2r + \frac{7\pi r}{10}$ centimetres.



Find the value of x. [3]

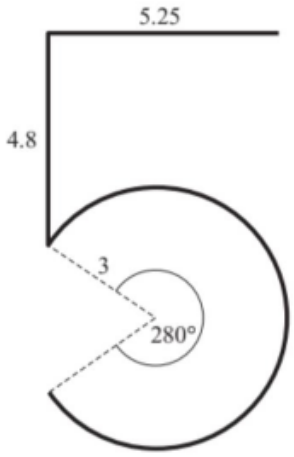
0580/41/O/N/16 10



8. The diagram shows a circle, radius r cm and minor sector angle $x°$.
The perimeter of the major sector is three times the perimeter of the minor sector.
Show that $x = \frac{90(\pi-2)}{\pi}$. [4]

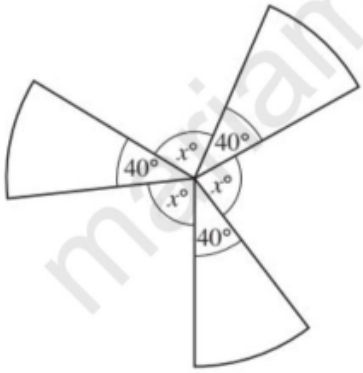
0580/42/O/N/22 Q10(c)

9. A thin piece of wire is shaped into a figure five as shown.



The shape has two straight sections of length 5.25 cm and 4.8 cm. The curved part is the arc of the major sector of a circle, radius 3 cm. The angle of the major sector is $280°$. The total length of wire needed to make the figure is $(a + b\pi)$cm. Find the values of a and b. [2]
4024/11/M/J/14 Q7)

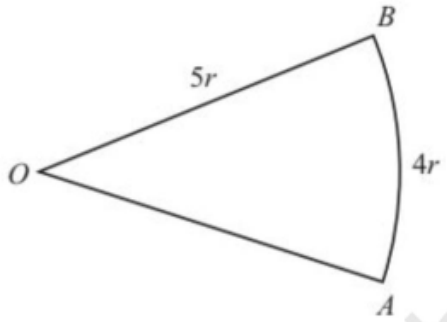
10. The diagram shows a shape made from thin wire.



The shape is formed from 3 identical sectors of a circle, each with an angle of 40°. The angle between each pair of sectors is $x°$.
(a) Calculate the value of x. [1]
(b) Given that the total length of the wire is 60 cm,

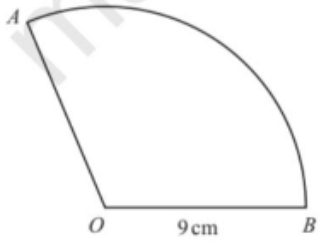
calculate the radius of one of the sectors. [3]
(c) **In this part take the value of π to be 3.** Given that the **total** length of the wire is 60 cm, calculate the radius of one of the sectors.
4024/12/O/N/10 Q27)

11. The diagram shows a sector of a circle, centre O, radius 5r.



The length of the arc AB is 4r.

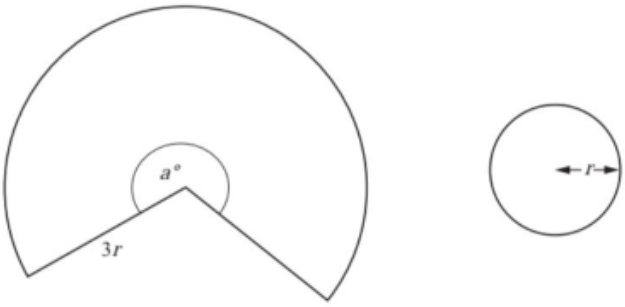
Find the area of the sector in terms of r, giving your answer in its simplest form. [3]
0580/23/O/N/12 Q17)



12. AB is an arc of a circle, centre O, radius 9 cm.
The length of the arc AB is 6π cm.
The area of the sector AOB is kπ cm^2.

Find the value of k. [3]
0580/21/M/J/16 Q20)

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

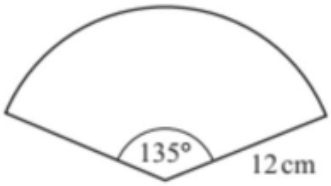


The ratio of the area of the sector to the area of the circle with radius cm is $8:1$.
(a) Find the value of a . [3]
(b) Find an expression, in terms of π and r, for the perimeter of the sector. [2]
4024/12/M/J/16 Q24

14. A hollow cone has a base radius 6 cm and slant height 10 cm.

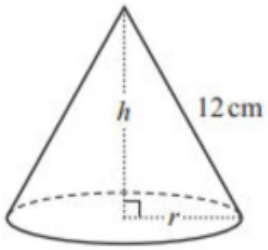
The curved surface of the cone is cut, and opened out into the shape of a sector of a circle, with angle x° and radius r cm.
(a) Write down the value of r. [1]
(b) Calculate x. [2]
4024/12/O/N/14 Q14)

15. (a)(i) A sector of a circle has radius 12cm and an



angle of 135°.

(i) Calculate the length of the arc of this sector.
Give your answer as a multiple of π. [2]



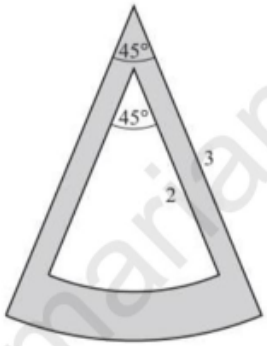
(ii) The sector is used to make a cone.

(a) Calculate the base radius, r [2]

(b) ~~Calculate the height of the cone, h.~~ [3]

0580/42/M/J/15 Q4

16. The diagram shows part of an earring.



It is in the shape of a sector of a circle of radius 3 cm and angle $45°$, from which a sector of radius 2 cm and angle $45°$ has been removed.

(a) Calculate the shaded area.

Give your answer in the form $\frac{a\pi}{b}$, where a and b are integers and as small as possible.

[2]

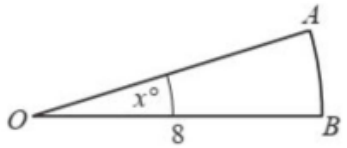
(b) The earring is cut from a sheet of silver.

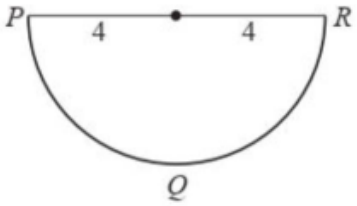
The mass of 1 cm^2 of the silver sheet is 1.6 g.

By taking the value of π to be 3 , estimate the

mass of the earring. [1]
4024/12/M/J/13 Q17)

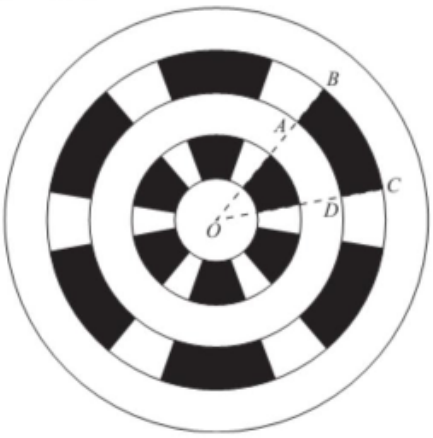
17. OAB is a sector of a circle with centre O and radius 8 cm.





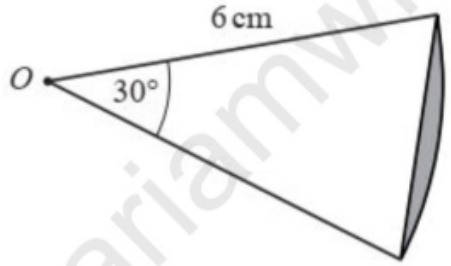
$A\hat{O}B = x°$.
(a) Write down an expression, in terms of x and π, for the area of the sector OAB. [1]
(b) PQR is a semicircle of radius 4 cm.
The area of the sector OAB is 1/3 of the area of this semicircle. Calculate the value of x.
4024/01/M/J/05 Q18

18. The diagram shows the metal cover for a circular drain.
Water drains out through the shaded sections.
O is the centre of circles with radii 1 cm, 2 cm, 3 cm, 4 cm and 5 cm.
The cover has rotational symmetry of order 6 and $B\hat{O}C = 40°$.



(a) Calculate the area of the shaded section ABCD, giving your answer in terms of π.[2]
(b) The total area of the metal (unshaded) sections of the cover is $\frac{55}{3}\pi$ cm^2.
(i) Calculate the total area of the shaded sections, giving your answer in terms of π. [1]
(ii) Calculate the fraction of the total area of the cover that is metal (unshaded).
Give your answer in its simplest form. [1]
4024/11/M/J/13 Q19)

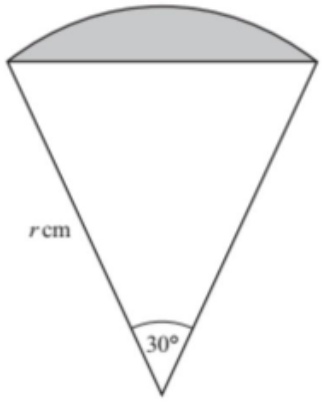
19. The diagram shows a sector of a circle, centre O



and radius 6cm.

The sector angle is 30°. The area of the shaded segment is (kπ – c) cm^2, where k and c are integers. Find the value of k and the value of c. [3]
0580/22/O/N/17 Q23)

20. The diagram shows a sector of a circle, radius r cm.



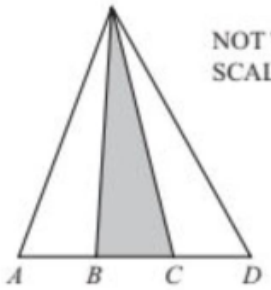
(i) Show that the area of the shaded segment is
$\frac{1}{4}r^2(\frac{1}{3}\pi - 1)\text{cm}^2$ [4]

(ii) ~~The area of the segment is 5 cm^2. Find the value of r~~. [3]

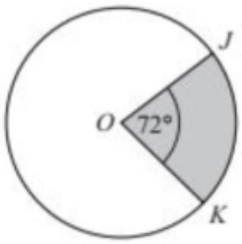
0580/43/O/N/14 Q7(c)(ii)

21. The total area of each of the following shapes is X.

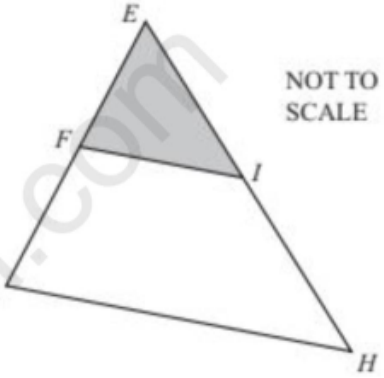
The area of the shaded part of each shape is kX.
For each shape, find the value of k and write your answer below each diagram.



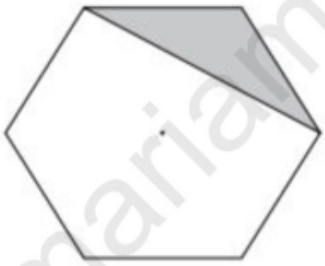
$AB = BC = CD$



Angle $JOK = 72°$

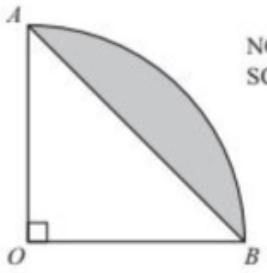


$EF = FG$ and $EI = IH$



The shape is a regular hexagon.

$k =$ .....



The diagram shows a sector of a circle centre O.
Angle $AOB = 90°$

$k =$ .....

[10]

0580/42/M/J/14 Q11)

Answers

1) 12.56	12) 27
2) (a) 15.7 (b) 33.7	13) (a) a=320 (b) $\frac{16}{3}\pi r + 6r$
3) 2π	14) (a) 10 (b)216
4) p = 12 , q = 12/5	15) (a) (i) 9π (ii) (a) 4.5 (b) 11.1
5) 315	16) (a) $\frac{5\pi}{8}$ (b) 3
6) (a)$\frac{\pi r^2}{6}$ (b)2r + $\frac{\pi r}{3}$	17) (a)$\frac{8x}{45}\pi$ (b)15
7) (a)115 (b)126	18) (a) 7π/9 b(i) $6\frac{2}{3}\pi$ (ii)11/15
9) a= 10.05 , b =$4\frac{2}{3}$	19) k = 3 , c = 9
10) a)3 b)80 c)7 ½	20) 20.6
11) $10r^2$	21) 1/3 , 72/360, 1/4, 1/6, $\frac{\pi-2}{\pi}$ or 0.363