

Topic 4 – Circular Measure (Textbook)

Exercise 18A

Question 2

Each of the following is an angle in radians. Without using a calculator change these to degrees.

(a)  $\frac{1}{3}\pi$

(b)  $\frac{1}{20}\pi$

(c)  $\frac{1}{5}\pi$

(d)  $\frac{1}{8}\pi$

(e)  $\frac{1}{9}\pi$

(f)  $\frac{2}{3}\pi$

(g)  $\frac{5}{8}\pi$

(h)  $\frac{3}{5}\pi$

(i)  $\frac{1}{45}\pi$

(j)  $6\pi$

(k)  $-\frac{1}{2}\pi$

(l)  $\frac{5}{18}\pi$

Question 2

Without the use of a calculator write down the exact values of the following.

(a)  $\sin \frac{1}{3}\pi$

(b)  $\cos \frac{1}{4}\pi$

(c)  $\tan \frac{1}{6}\pi$

(d)  $\cos \frac{3}{2}\pi$

(e)  $\sin \frac{7}{4}\pi$

(f)  $\cos \frac{7}{6}\pi$

(g)  $\tan \frac{5}{3}\pi$

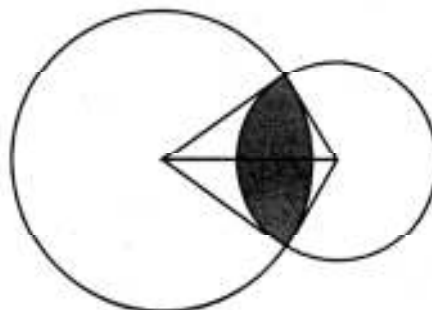
(h)  $\sin^2 \frac{2}{3}\pi$

Question 9

Two circles of radii 5 cm and 12 cm are drawn, partly overlapping. Their centres are 13 cm apart. Find the area common to the two circles.

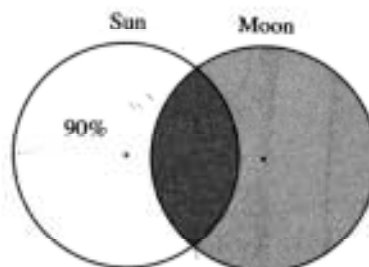
Question 10

The diagram shows two intersecting circles of radius 6 cm and 4 cm with centres 7 cm apart. Find the perimeter and area of the shaded region common to both circles.



Question 11

An eclipse of the sun is said to be 10% total when 10% of the area of the sun's disc is hidden behind the disc of the moon. A child models this with two discs, each of radius  $r$  cm, as shown.

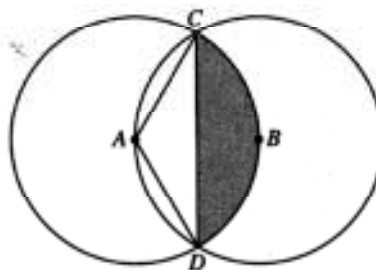


- Calculate, in terms of  $r$ , the distance between the centres of the two discs.
- Calculate also the distance between the centres when the eclipse is 80% total.

Miscellaneous Exercise 18

Question 4

The diagram shows two circles, with centres  $A$  and  $B$ , intersecting at  $C$  and  $D$  in such a way that the centre of each lies on the circumference of the other. The radius of each circle is 1 unit. Write down the size of angle  $CAD$  and calculate the area of the shaded region (bounded by the arc  $CBD$  and the straight line  $CD$ ). Hence show that the area of the region common to the interiors of the two circles is approximately 39% of the area of one circle. (OCR)



Question 5

In the diagram,  $ABC$  is an arc of a circle with centre  $O$  and radius 5 cm. The lines  $AD$  and  $CD$  are tangents to the circle at  $A$  and  $C$  respectively. Angle  $AOC = \frac{2}{3}\pi$  radians. Calculate the area of the region enclosed by  $AD$ ,  $DC$  and the arc  $ABC$ , giving your answer correct to 2 significant figures. (OCR)

