Radians, Arcs and Sectors

Exercise 8S Skills Practice

1 Convert each angle from radians to degrees.

a $\frac{\pi}{2}$ **b** $\frac{\pi}{3}$ **c** $\frac{2\pi}{3}$ **d** $\frac{\pi}{12}$ **e** $\frac{7\pi}{6}$ **f** 8π

g $\frac{\pi}{9}$ **h** 5π **i** $\frac{5\pi}{4}$ **j** $\frac{7\pi}{3}$ **k** $\frac{3\pi}{8}$ **l** $\frac{9\pi}{2}$

2 Convert each angle from radians to degrees, correct to 1 dp.

a 1^c **b** 4^c **c** 1.6^c **d** 0.35^c **e** 8.4^c **f** 1.09^c

3 Convert each angle from degrees to radians, giving your answers in terms of π.

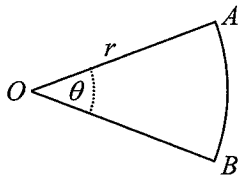
a 360° **b** 30° **c** 45° **d** 135° **e** 300° **f** 10°

g 270° **h** 20° **i** 720° **j** 480° **k** 22.5° **l** 1350°

4 Convert each angle from degrees to radians, correct to 2 dp.

a 50° **b** 250° **c** 34° **d** 196° **e** 18.5° **f** 710°

Questions 5 to 8 refer to sector OAB shown below.



5 Calculate the length of the arc AB in cm correct to 1 dp when

a $r = 10$ cm and $\theta = \frac{\pi}{6}$ **b** $r = 18.5$ cm and $\theta = 45°$

6 Calculate the perimeter and the area of the sector OAB correct to 3 sf when

a $r = 5$ cm and $\theta = \frac{\pi}{3}$ **b** $r = 13.2$ cm and $\theta = \frac{3\pi}{4}$

c $r = 8$ cm and $\theta = 60°$ **d** $r = 63.5$ cm and $\theta = 102°$

7 Calculate the angle of the sector, θ, in radians correct to 2 dp when

a arc $AB = 9.2$ cm and $r = 6$ cm **b** arc $AB = 28.8$ cm and $r = 7.3$ cm

8 Calculate the radius of the sector, r, in cm correct to 1 dp when

a area of sector $OAB = 23.9$ cm^2 and $\theta = \frac{\pi}{4}$

b perimeter of sector $OAB = 38.5$ cm and $\theta = 120°$

Exercise 8S Skills Practice

1 **a** 90° **b** 60° **c** 120° **d** 15°
e 210° **f** 1440° **g** 20° **h** 900°
i 225° **j** 420° **k** 67.5° **l** 810°

2 **a** 57.3° **b** 229.2° **c** 91.7°
d 20.1° **e** 481.3° **f** 62.5°

3 **a** 2π **b** $\pi/6$ **c** $\pi/4$ **d** $3\pi/4$ **e** $5\pi/3$ **f** $\pi/18$
g $3\pi/2$ **h** $\pi/9$ **i** 4π **j** $8\pi/3$ **k** $\pi/8$ **l** $15\pi/2$

4 **a** 0.87 **b** 4.36 **c** 0.59
d 3.42 **e** 0.32 **f** 12.39

5 **a** 5.2 cm **b** 14.5 cm

6 **a** 15.2 cm, 13.1 cm^2
b 57.5 cm, 205 cm^2
c 24.4 cm, 33.5 cm^2
d 240 cm, 3590 cm^2

7 **a** 1.53 **b** 3.95

8 **a** 7.8 **b** 9.4