

1 *Arrowline Enterprises* is considering two possible logos:

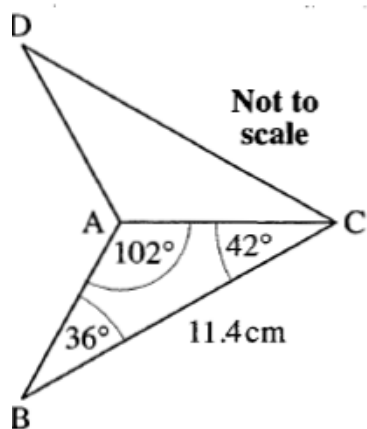
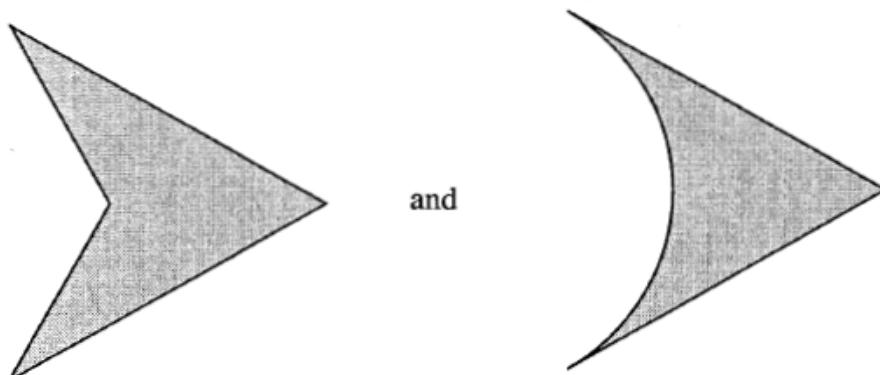


Fig. 10.1

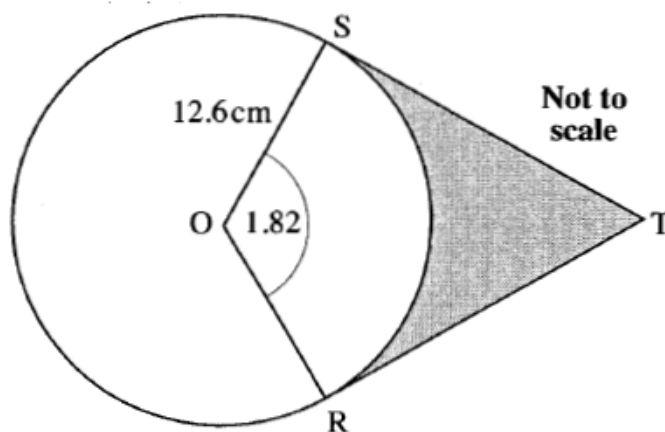


Fig. 10.2

(i) Fig. 10.1 shows the first logo ABCD. It is symmetrical about AC.

Find the length of AB and hence find the area of this logo. [4]

(ii) Fig. 10.2 shows a circle with centre O and radius 12.6 cm. ST and RT are tangents to the circle and angle SOR is 1.82 radians. The shaded region shows the second logo.

Show that $ST = 16.2$ cm to 3 significant figures.

Find the area and perimeter of this logo. [8]

2

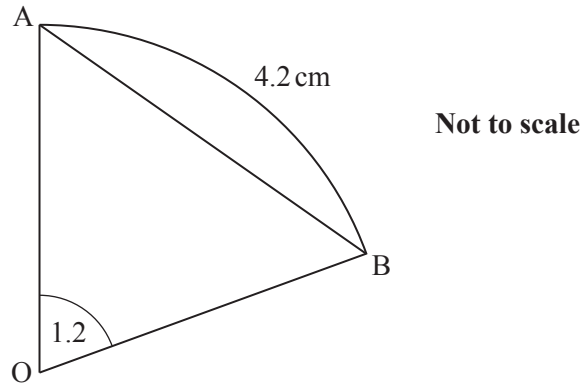


Fig. 4

Fig. 4 shows sector OAB with sector angle 1.2 radians and arc length 4.2 cm. It also shows chord AB.

(i) Find the radius of this sector. [2]

(ii) Calculate the perpendicular distance of the chord AB from O. [2]

3

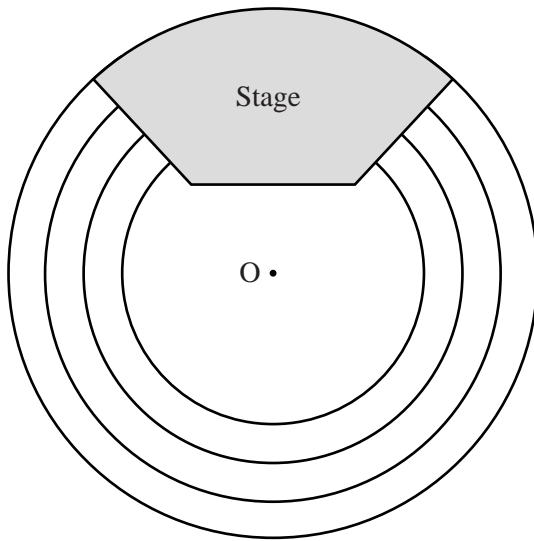


Fig. 13.1

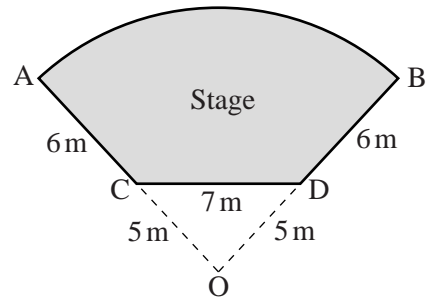


Fig. 13.2

In a concert hall, seats are arranged along arcs of concentric circles, as shown in Fig. 13.1. As shown in Fig. 13.2, the stage is part of a sector ABO of radius 11 m. Fig. 13.2 also gives the dimensions of the stage.

- (i) Show that angle COD = 1.55 radians, correct to 2 decimal places. Hence find the area of the stage. [6]
- (ii) There are four rows of seats, with their backs along arcs, with centre O, of radii 7.4 m, 8.6 m, 9.8 m and 11 m. Each seat takes up 80 cm of the arc.
 - (A) Calculate how many seats can fit in the front row. [4]
 - (B) Calculate how many more seats can fit in the back row than the front row. [2]

- 4 Charles has a slice of cake; its cross-section is a sector of a circle, as shown in Fig. 9. The radius is r cm and the sector angle is $\frac{\pi}{6}$ radians.

He wants to give half of the slice to Jan. He makes a cut across the sector as shown.

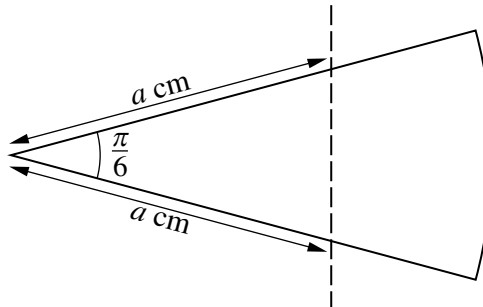


Fig. 9

Show that when they each have half the slice, $a = r\sqrt{\frac{\pi}{6}}$. [4]

- 5 A sector of a circle has area 8.45 cm^2 and sector angle 0.4 radians. Calculate the radius of the sector. [3]

6 (i)

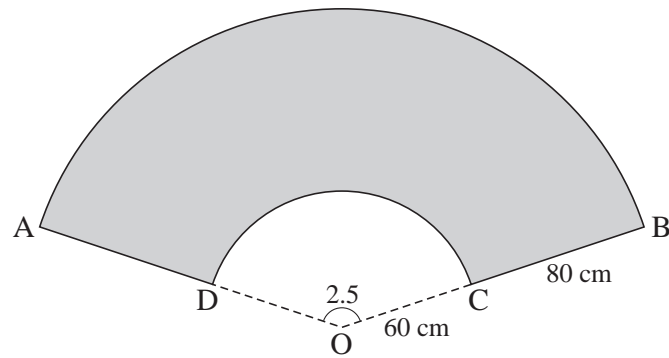


Fig. 11.1

Fig. 11.1 shows the surface ABCD of a TV presenter's desk. AB and CD are arcs of circles with centre O and sector angle 2.5 radians. $OC = 60$ cm and $OB = 140$ cm.

(A) Calculate the length of the arc CD. [2]

(B) Calculate the area of the surface ABCD of the desk. [4]

(ii) The TV presenter is at point P, shown in Fig. 11.2. A TV camera can move along the track EF, which is of length 3.5 m.

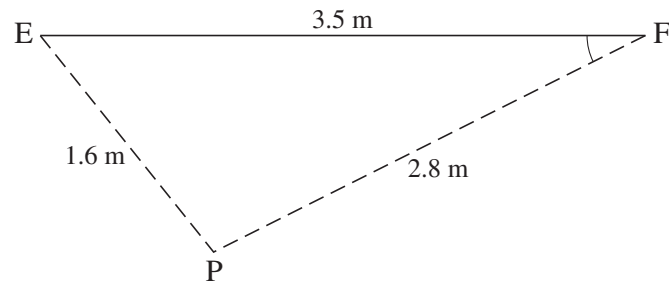


Fig. 11.2

When the camera is at E, the TV presenter is 1.6 m away. When the camera is at F, the TV presenter is 2.8 m away.

(A) Calculate, in degrees, the size of angle EFP. [3]

(B) Calculate the shortest possible distance between the camera and the TV presenter. [2]