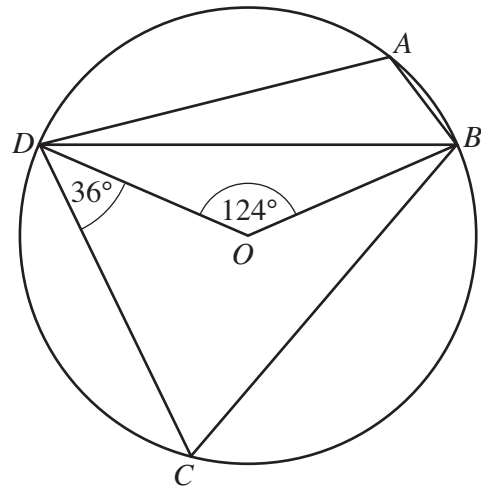


- 1 (a) In the diagram, the points  $A$ ,  $B$ ,  $C$  and  $D$  lie on a circle, centre  $O$ .

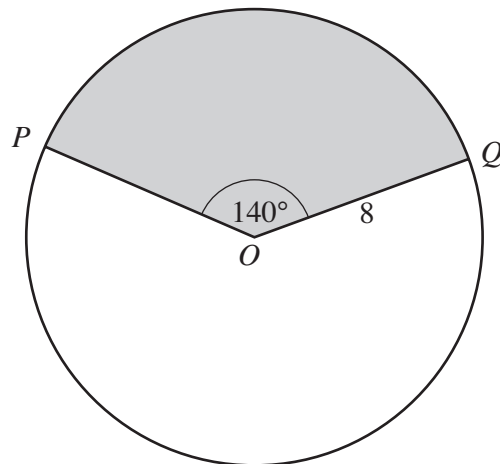
$$\widehat{DOB} = 124^\circ \text{ and } \widehat{CDO} = 36^\circ.$$



Calculate

- (i)  $\widehat{DCB}$ , [1]
- (ii)  $\widehat{DAB}$ , [1]
- (iii)  $\widehat{ODB}$ , [1]
- (iv)  $\widehat{CBO}$ . [1]

- (b) The diagram shows a circle, centre  $O$ , with the sector  $POQ$  shaded.



Given that  $\widehat{POQ} = 140^\circ$  and the radius of the circle is 8 cm, calculate

- (i) the area of the shaded region, [2]
- (ii) the **total** perimeter of the **unshaded** region. [3]
-

2(a) These are the prices for a ride in an amusement park.

Adult	\$3.60
Child	\$2.25

(i) A family of two adults and three children went on the ride.  
They paid with a \$20 note.

Calculate the change they received. [1]

(ii) Express \$2.25 as a percentage of \$3.60. [1]

(b) Diagram I represents part of the framework of the ride.

The points  $A, B, C, D, E$  and  $F$  are on the framework.  
The points  $H, C, G, E$  and  $F$  lie on a horizontal line.  
The lines  $BH$  and  $DG$  are vertical.

$BC = 80$  m,  $HC = 60$  m,  $DG = 40$  m,  $GE = 35$  m and  $\hat{DCG} = 32^\circ$ .

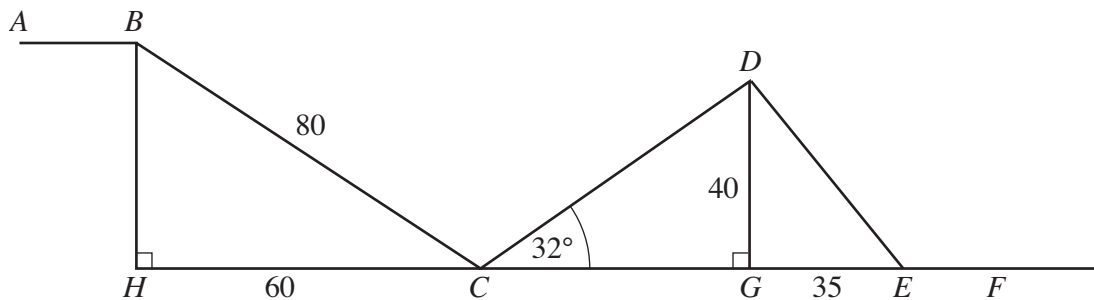


Diagram I

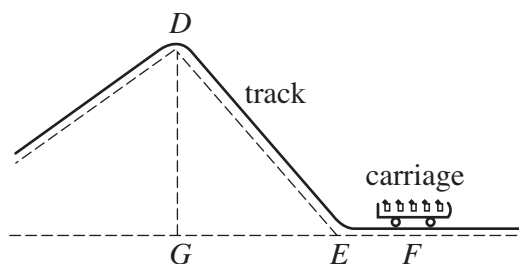
Calculate

(i)  $\hat{HCB}$ , [2]

(ii)  $CD$ , [3]

(iii) the angle of depression of  $E$  from  $D$ . [2]

(c)



**Diagram II**

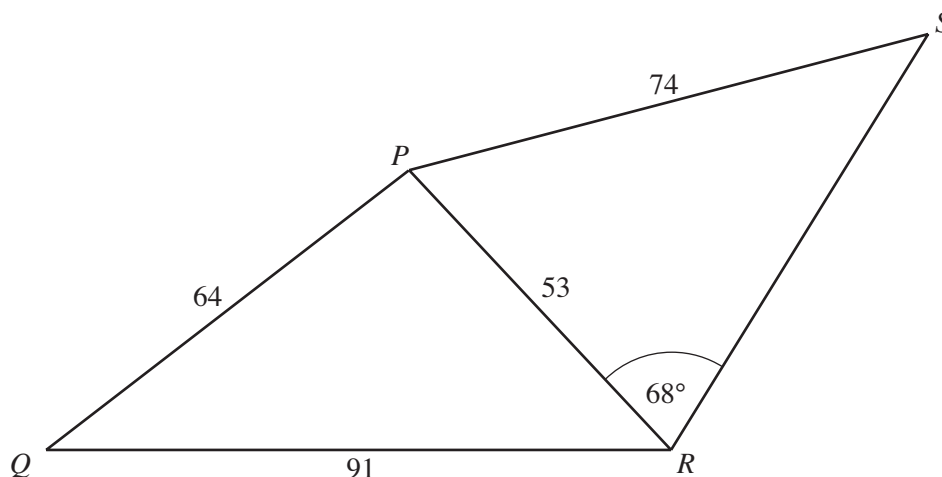
Diagram II shows part of the ride.

The carriage that carried the family was 4.6 m long.

It was travelling at a constant speed of 15 m/s as it passed the point  $F$ .

- (i) Calculate, correct to the nearest hundredth of a second, the time taken for the carriage to pass the point  $F$ . [2]
- (ii) Express 15 m/s in kilometres per hour. [1]
- 

**3**



The diagram shows a footpath  $PR$  across a park  $PQRS$ .

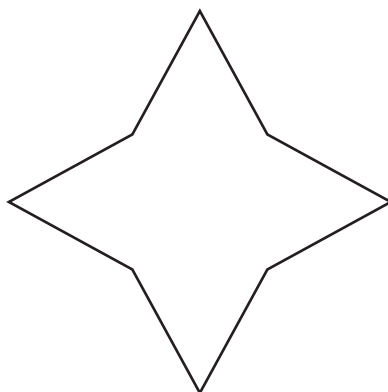
$PQ = 64$  m,  $PR = 53$  m,  $PS = 74$  m and  $QR = 91$  m.

Angle  $PRS = 68^\circ$ .

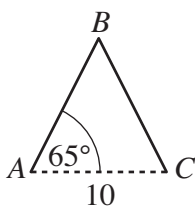
Calculate

- (a)  $\hat{QPR}$ , [3]
- (b)  $\hat{RPS}$ , [3]
- (c) the area of triangle  $PRS$ . [2]
-

4 Eight straight paths in a level garden form this shape with rotational symmetry of order four.



(a)

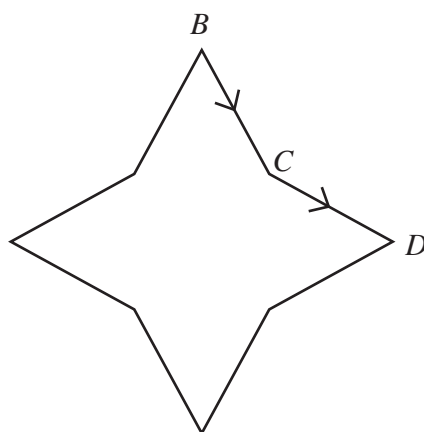


The two paths shown,  $AB$  and  $BC$ , form part of the isosceles triangle  $ABC$ .  
 $AC = 10\text{ m}$  and angle  $BAC = 65^\circ$ .

Calculate

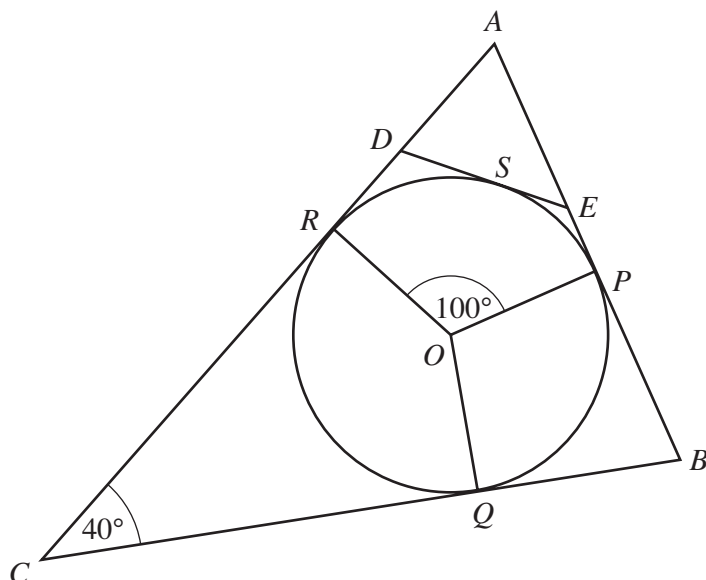
- (i) the length of the path  $AB$ , [2]
- (ii) the area of triangle  $ABC$ , [2]
- (iii) the area of garden enclosed by all 8 paths. [2]

(b)



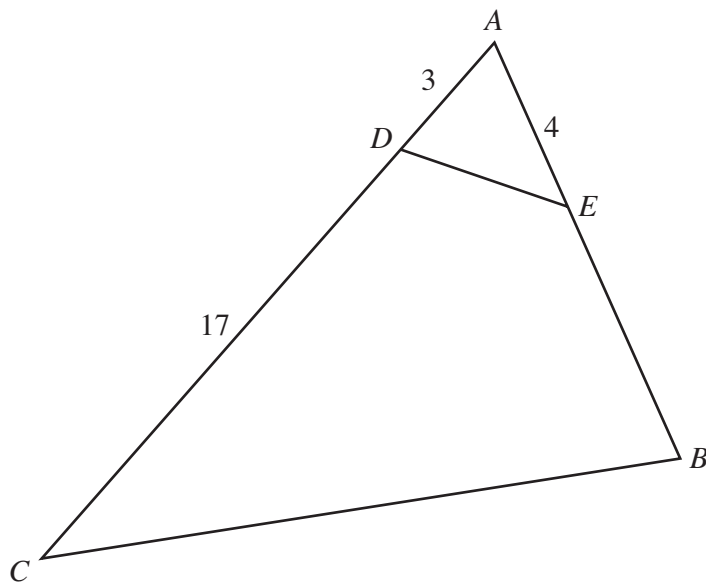
Ada walked along the paths  $BC$  and  $CD$ .

- (i) Calculate  $\hat{BCD}$ . [2]
- (ii) After walking in the direction  $BC$ , Ada turned to walk in the direction  $CD$ .  
 State the value of the angle through which she turned. [1]



The diagram shows a circle, centre  $O$ .  
The lines  $AB$ ,  $BC$  and  $CA$  touch the circle at  $P$ ,  $Q$  and  $R$  respectively.

- (a) (i) Explain why  $C\hat{Q}O = 90^\circ$ . [1]  
 (ii) Given that  $A\hat{C}B = 40^\circ$ , find  $R\hat{O}Q$ . [1]
- (b) The line  $DE$  touches the circle at  $S$ .  
The triangles  $ABC$  and  $ADE$  are similar.
- (i) Write down the value of  $A\hat{E}D$ . [1]  
 (ii) Given that  $R\hat{O}P = 100^\circ$ , find  $R\hat{O}S$ . [2]
- (iii)



Given also that  $AD = 3$  cm,  $CD = 17$  cm and  $AE = 4$  cm, calculate  $BE$ . [2]