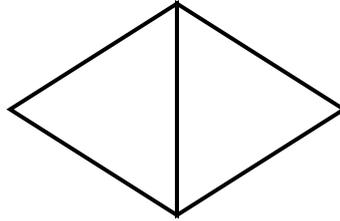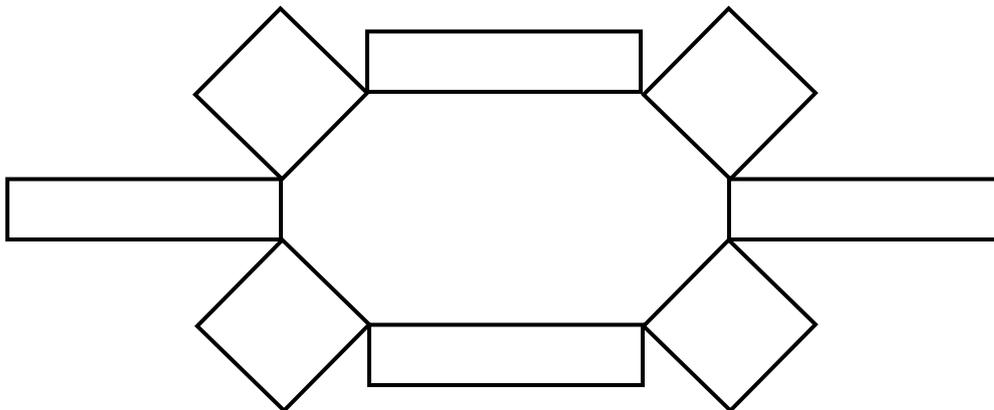**PROBLEM SOLVING WITH SHAPES – PRACTICE QUESTIONS**
CALCULATOR ALLOWED

1.
Two equilateral triangles, each of perimeter 90 cm, are joined
together to form a rhombus, pictured below.
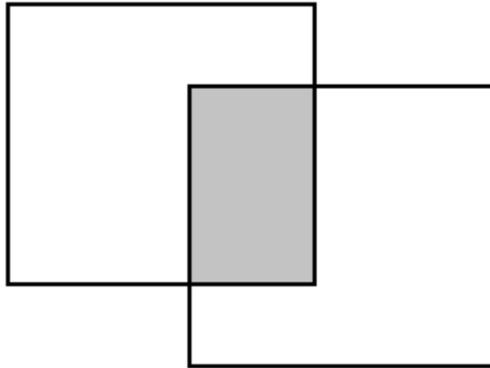

Find the perimeter of the rhombus.

2.
Four rectangles of length 2 cm and width 9 cm and four squares of length 4 cm are
arranged in the following pattern.

Find the perimeter of the octagon in the middle of the pattern.

3.
Pictured below is a shape formed from two identical squares overlapping.
The shaded region has width 4 cm and height 9 cm.
The shaded region is 25% of the area of one of the squares.
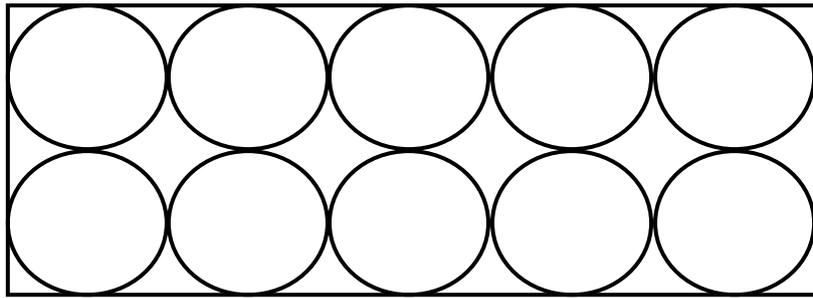
Find the perimeter of the shape.

4.
Pictured below is a parallelogram ABCD attached to an isosceles triangle CDE.
The perimeter of ABCD is 38 cm.
The perimeter of CDE is 25 cm.
AD = 12 cm.

A   12 cm   D

B   C
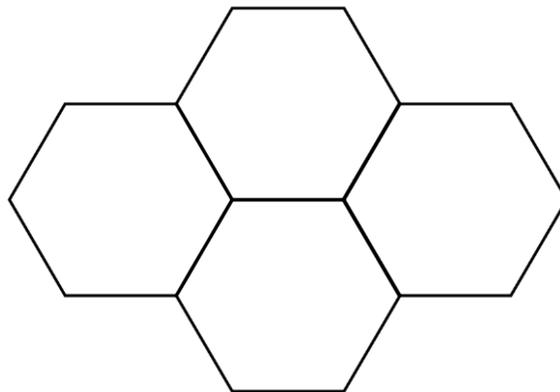
E
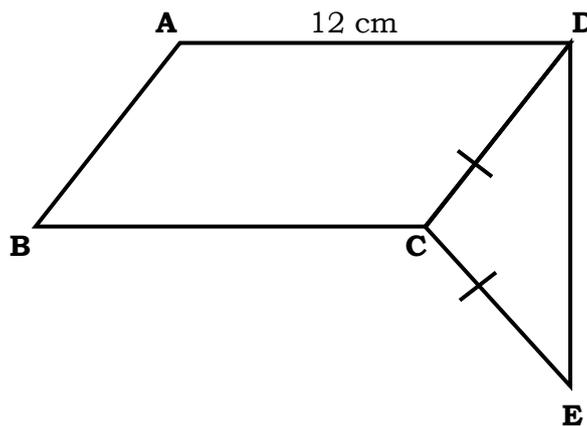
Find the length of DE.

5.

Pictured below are 10 circles tightly packed inside a rectangle.
The circles each have a radius of 6 cm.

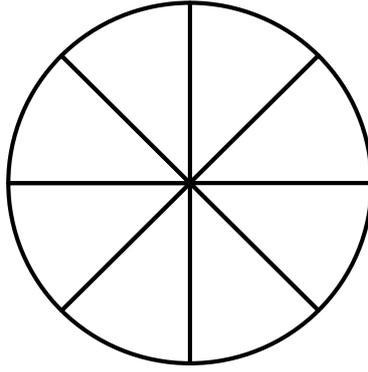
Find the area of the rectangle.

6.

This honeycomb pattern is made by joining together four identical regular hexagons.
Each hexagon has a perimeter of 18 cm.

Find the distance around the outer edge of the shape.

7.

Pictured below is a bicycle wheel made of a circular rim and 8 spokes.
The wheel has a diameter of 70 cm.

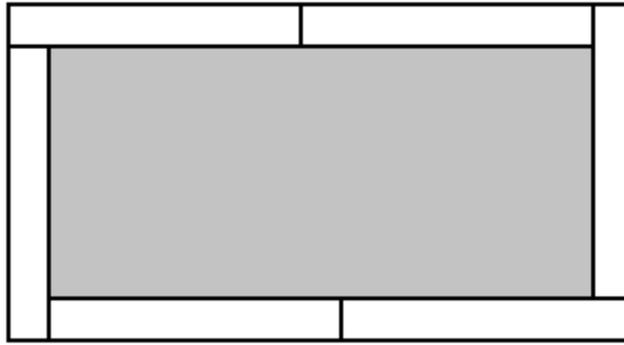Find the total length of the rim and the spokes, to the nearest centimetre.

8.

Pictured below is a rectangle formed of a rectangle (R) and a square (S).
The area of S is 16 cm² and the perimeter of R is 30 cm.

Find the area of the whole shape.

9.
Pictured below is a shape made from six identical rectangles.
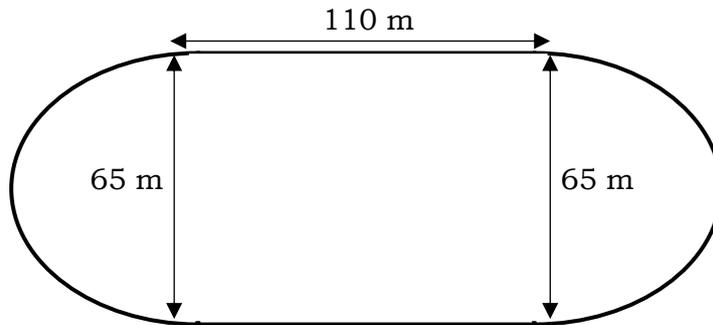Each of these rectangles has height 2 cm and width 10 cm.

Find the area of the shaded region.

10.
Pictured below is an indoor cycling track.
The track is formed of two semi-circles of diameter 65 metres and a rectangle of width 110 metres.

Marta says "If I cycle around the track 12 times, I will have cycled over 5 kilometres".

Is Marta correct?

11.

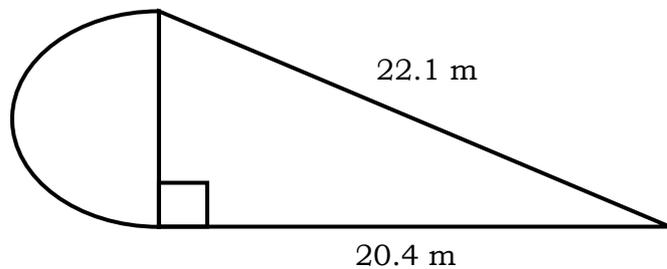A large rectangle is formed from four identical small rectangles.

The perimeter of one small rectangle is 32 cm.
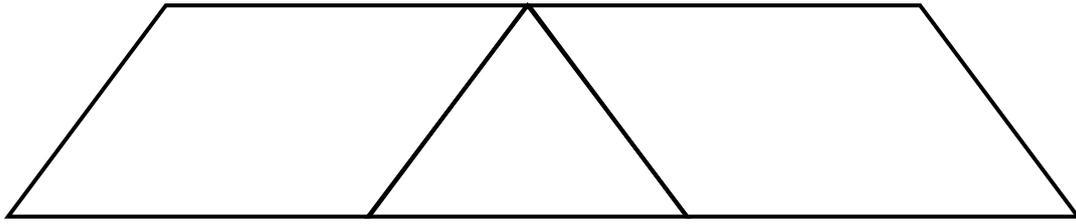
Find the perimeter of the large rectangle.

12.

The shape below is formed of a right-angled triangle and a semicircle.

22.1 m

20.4 m

Find the perimeter of the shape, to 1 decimal place.

13.

The shape below is formed of an equilateral triangle of side length 6 cm and two congruent parallelograms.

The perimeter of the whole shape is 54 cm.

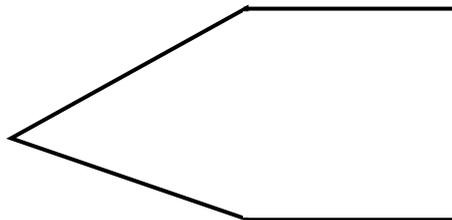Find the width of one of the parallelograms.

14.

The triangle below has perimeter 35 cm.
The square below has area 81 cm².

The triangle and the square are joined to form the pentagon below.
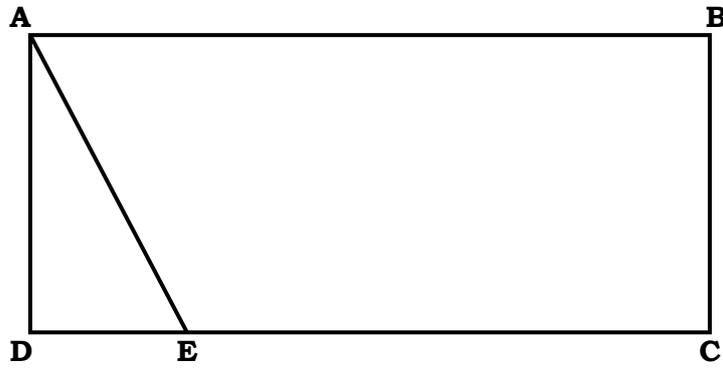
Find the perimeter of the pentagon.

15.
ABCD is a rectangle.
E is a point on the line CD.
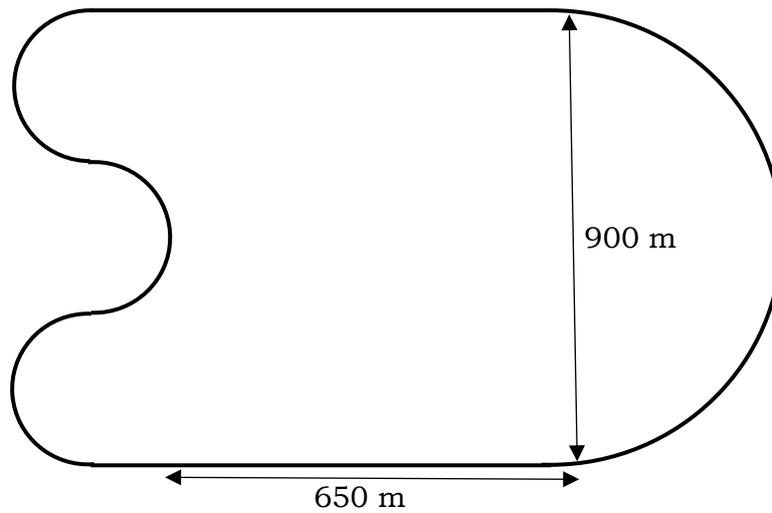AE = 26 cm
AB = 45 cm
DE : EC = 2 : 7.

Find the area of ABCD.

16.
Pictured below is a motor racing track.
The track is made up of two parallel straight lines, three identical semicircles and a larger semicircle.

900 m

650 m

A race consists of 25 laps of the track.

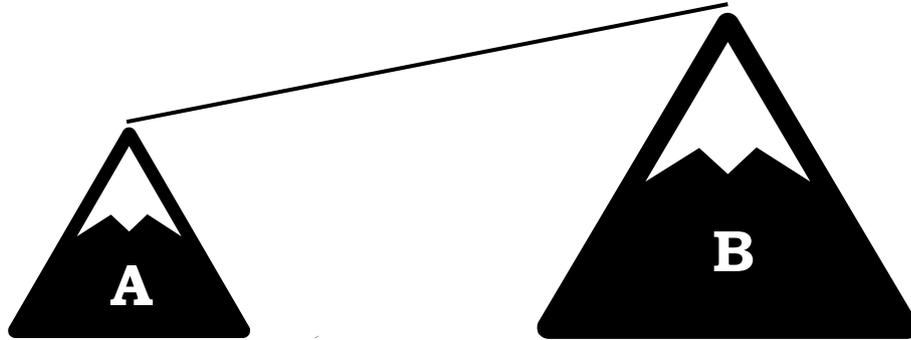Work out the total distance of the race, to the nearest kilometre.

17.
Pictured below are two mountains – A and B.
A chairlift runs from the top of Mountain A to the top of Mountain B.
The horizontal distance between the top of the mountains is 912 metres.
The height of Mountain A is 1.3 kilometres.
The length of the chairlift is 988 metres.

Find the height of Mountain B, in kilometres, to 2 significant figures.