# Unit 16 · Solid Objects

HARDER PRACTICE QUESTIONS

Full marks 28

Write your answers on separate paper. Show your working. Take $\pi = \frac{22}{7}$ wherever it is needed.

## 1 From the edges [4]

i. A prism has 15 edges. What is the shape of its base? Find its faces and vertices, and check them with $F + V = E + 2$.

ii. A pyramid has 10 edges. What is the shape of its base? How many faces and vertices has it?

iii. Can a pyramid have 15 edges? Give a reason.

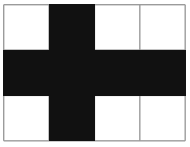
## 2 Cut off a corner [3]

The corner of a wooden cube is sliced off with one flat cut, making a small new triangular face. Count the faces, vertices and edges of the new solid, and check them with $F + V = E + 2$.

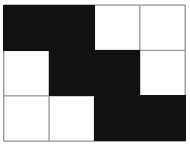
## 3 Will it fold? [4]

Each shape below is made of six squares. Which fold into a cube? For each one that doesn't, say what goes wrong.

Shape A



Shape B



Shape C



Shape D



## 4 A box from one sheet [4]

A cuboid box is 5 cm long, 3 cm wide and 2 cm high. Its net has a strip of the four side faces with one 5 cm by 3 cm face above it and one below it, both joined to the same 5 cm rectangle of the strip.

i. Find the total area of the net.

ii. How long is the strip, and how tall is the net from top to bottom?

iii. The net is cut from a rectangular sheet of just that length and height. What area of the sheet is wasted?

## 5 A tin's label [3]

A cylindrical tin has a radius of 7 cm and a height of 10 cm.

i. Its net is a rectangle and two circles. What are the length and width of the rectangle?

ii. Find the total area of the net.

## 6 From a sector to a cone [3]

A cone is made from a half circle of paper of radius 14 cm, with a circle for its base.

i. How long is the curved edge of the half circle?

ii. Find the radius of the base circle.

iii. If a quarter circle of the same radius were used instead, what would the base radius be?

## 7 Spot the error [3]

Find the mistake and correct it.

Tenzing drew a net of a triangular prism with two triangles and two rectangles. He wrote: "$F = 4$, $V = 6$, $E = 9$." Use $F + V = E + 2$ to show that something is wrong. What is missing from his net?

## 8 Think [2]

Count the surfaces, edges and vertices of a cylinder ($F = 3$, $E = 2$, $V = 0$). Does $F + V = E + 2$ work? Should it? Explain.

## 9 Make your own [2]

Draw shape A from "Will it fold?" on squared paper and number its squares 1 to 6 so that it folds into a dice, with opposite faces adding up to 7. Which squares are opposite each other?