testbase

Week 20

3D Shapes

Name: _____

Class: _____

Date: _____

Time: **47 minutes**

Marks: **47 marks**

Comments:

1 Complete the table.
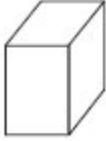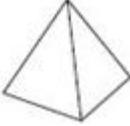
	number of faces	number of edges
cuboid	6	12
square-based pyramid	5	

1 mark

2 This is an open top box.
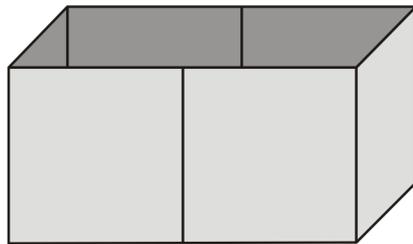
Put a tick (✓) for each diagram **if it is a net** for the box.

Put a cross (✗) if it is not.

The base is shaded in each one.
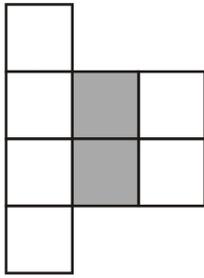
| A	B	C	D
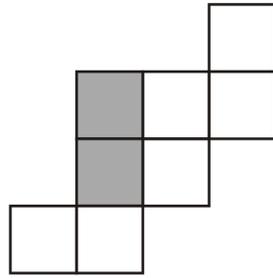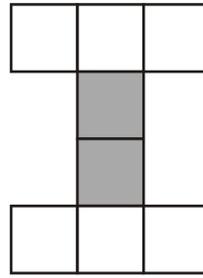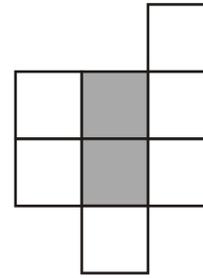
3

I'm thinking of a 3-D shape.
It has a square base.
It has 4 other faces, which are triangles.

What is the name of the 3-D shape?

_____

1 mark

2 marks

4 These nets will fold to make 3-D shapes.

Match each net to the name of its shape.

One has been done for you.

square – based pyramid

triangular prism

cube

square

tetrahedron

cuboid

1 mark

5 Draw in lines where you would fold this shape to make a cube.

Use a ruler to measure where they would go.
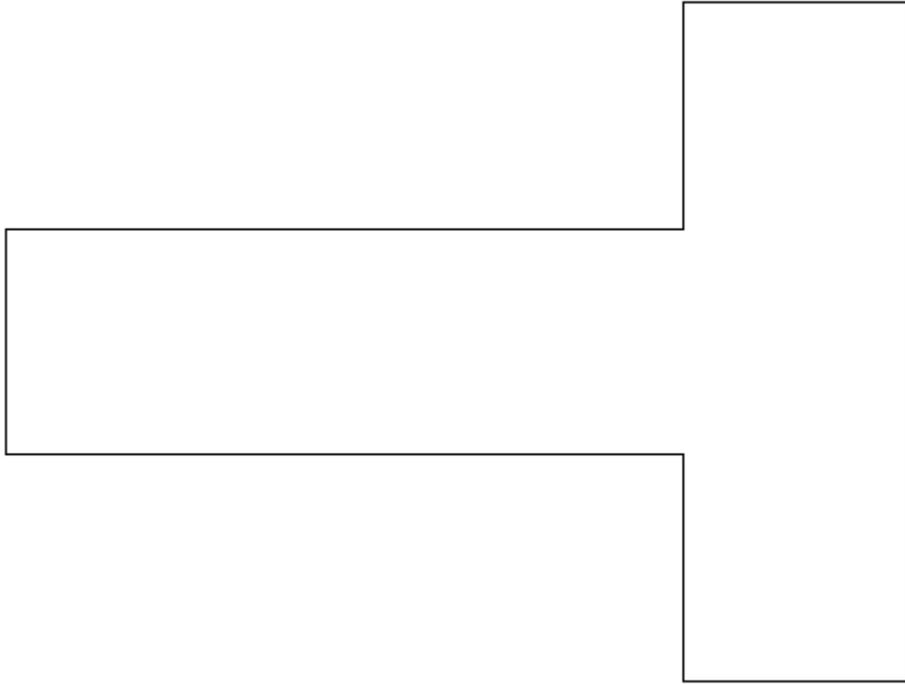
1 mark

6 Look at each of these diagrams.

Put a tick (✓) if it is the **net of a square based pyramid.**

Put a cross (✗) if it is **not.**

_____   _____

_____   _____
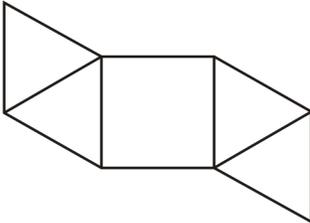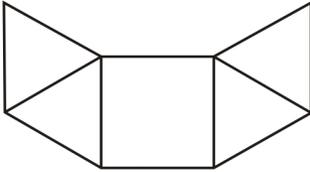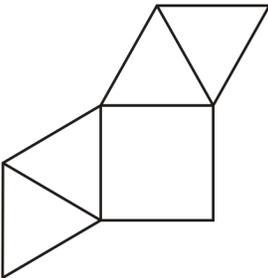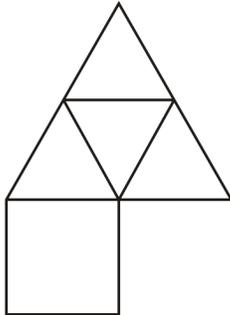
2 mark

**7** Here is an **open top** cube.
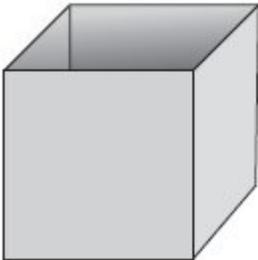
Here is the net from which it is made.

Put a tick (✔) on the square which is its **base**.
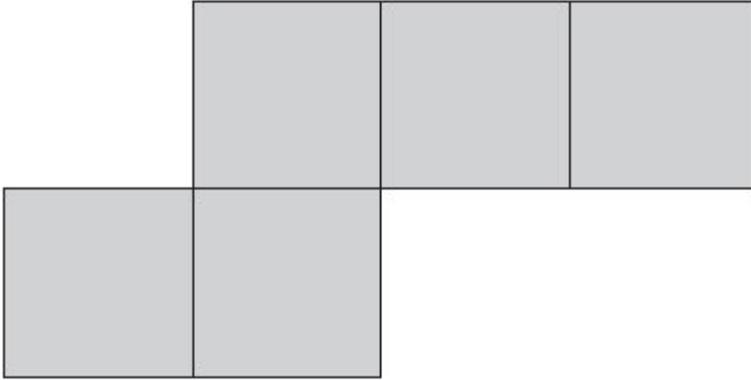
8

Tom makes this shape from four cubes stuck together.

Two circles are drawn on the shape.
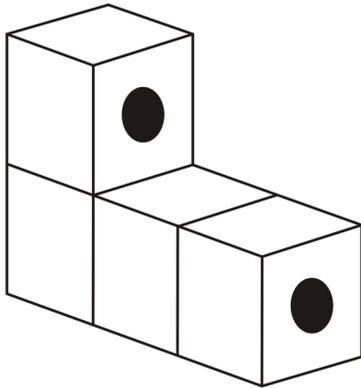
Tom moves the shape.

Draw the **circles** on the shape in its new position.
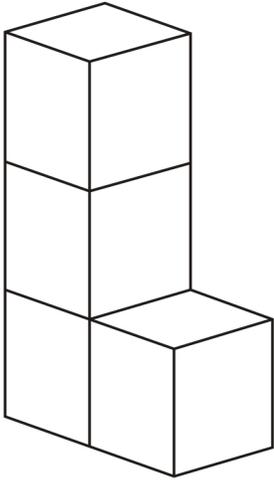
9 A cube has shaded triangles on three of its faces.
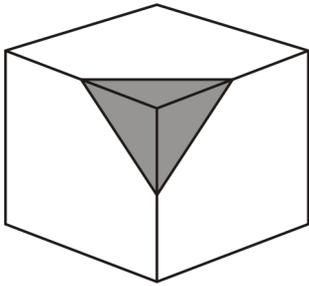
Here is the net of the cube.

Draw in the two missing shaded triangles.
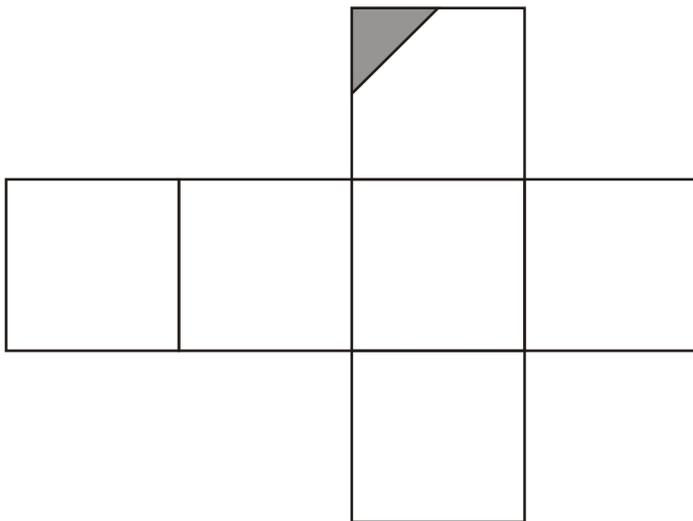
**10** **Two** of these diagrams are nets for a triangular prism.

Put a tick (✔) in them.
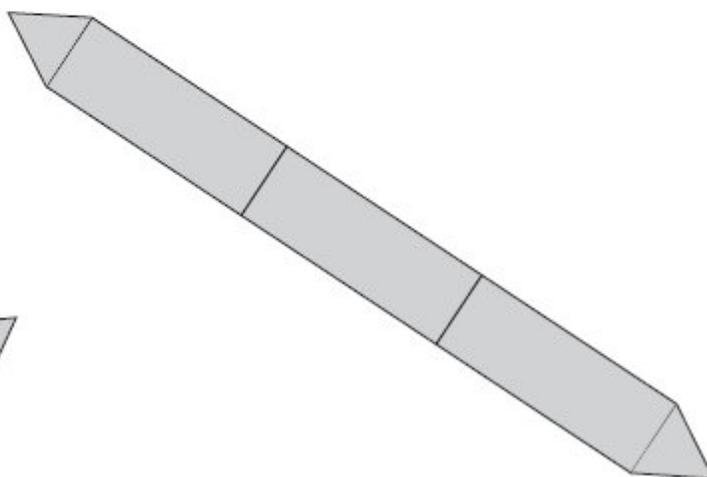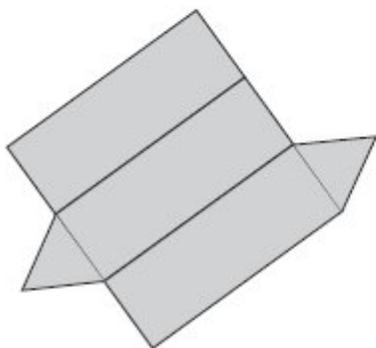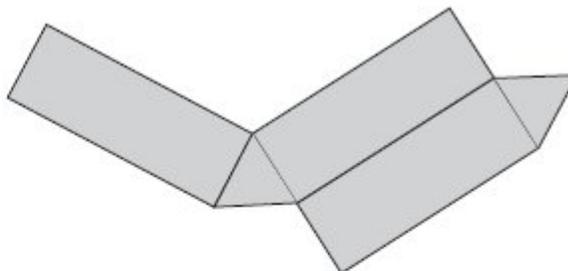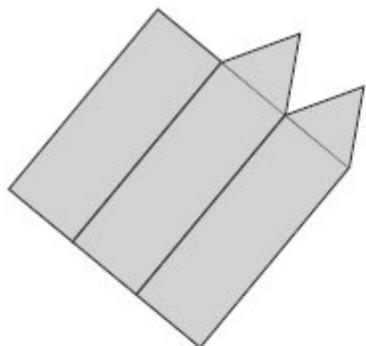
1 mark

11 Look at the net drawn on square paper.

It folds to make a prism.

Isometric grid
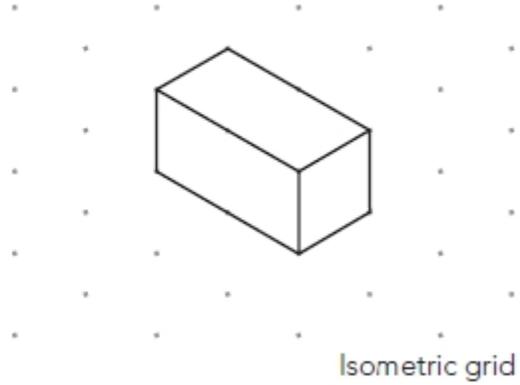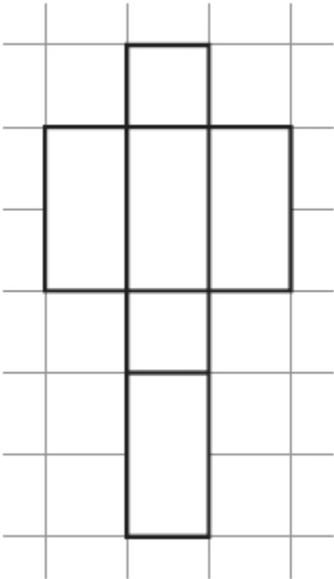
The net below folds to make a different prism.

Draw it on the grid.

Isometric grid
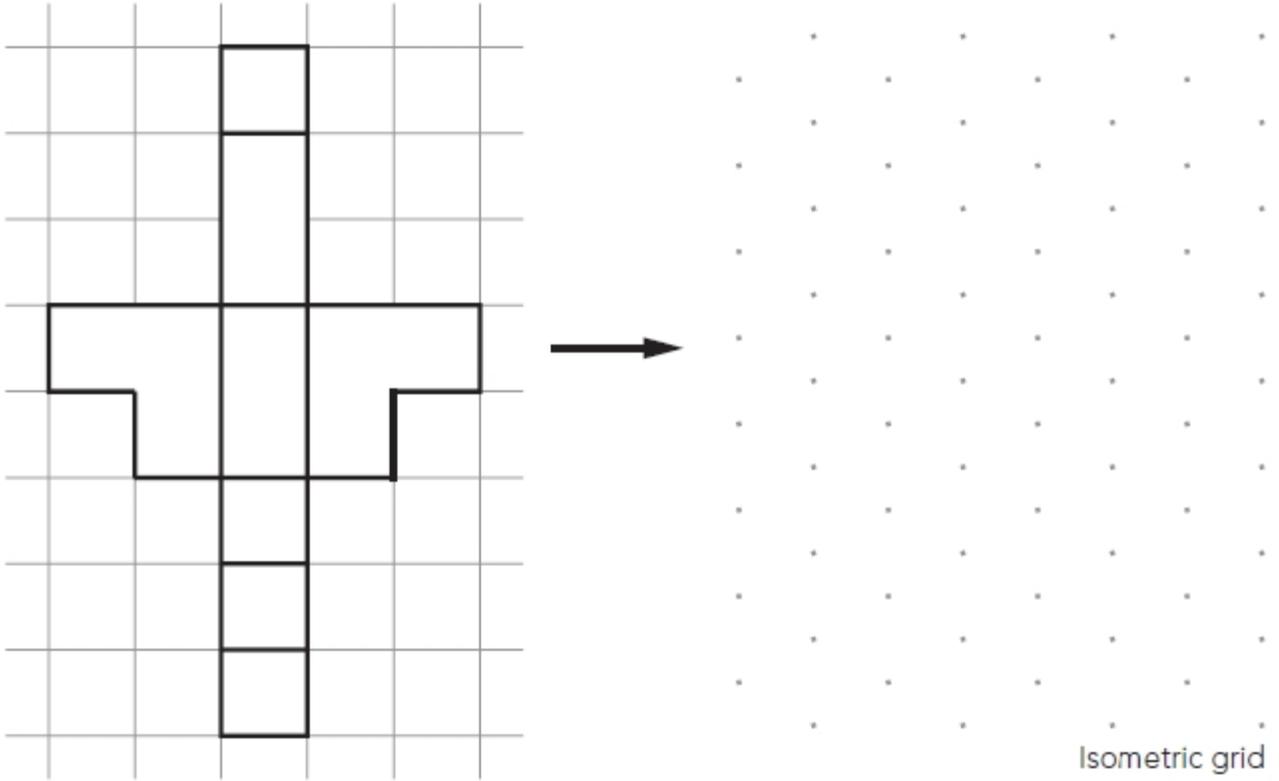
2 marks

12 Write each word in the correct box.

| faces | edges | vertices |

A cube has

6 ▭

8 ▭

12 ▭
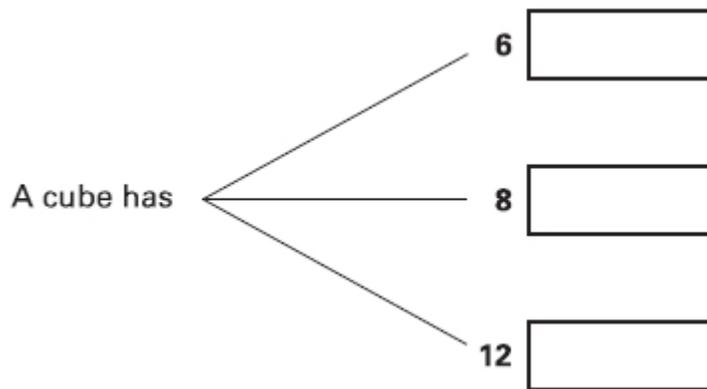
1 mark

13 Here is the net of a cube with no top.

The shaded square shows the bottom of the cube.

Draw an extra square to make the net of a cube which does have a top.
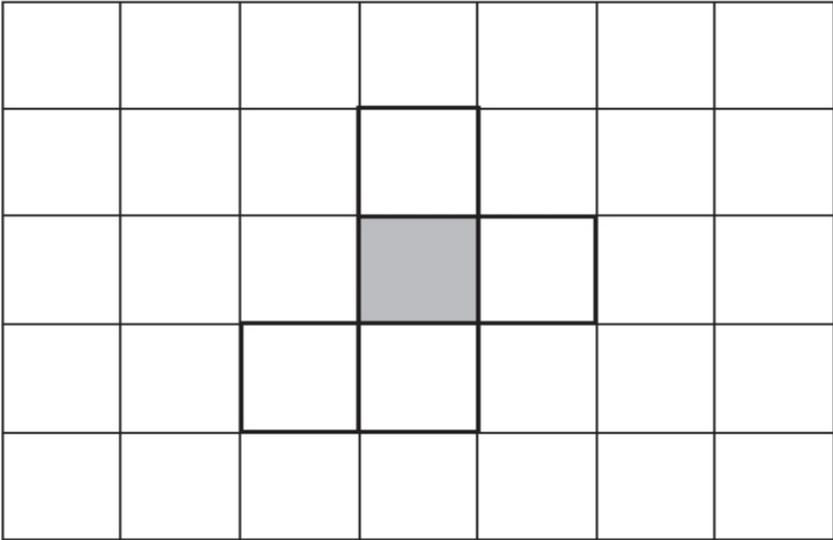
1 mark

14 This is a drawing of a pentagonal prism.
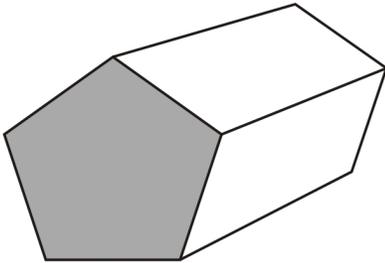
Tick (✔) the one shape that is a net for the pentagonal prism.

1 mark
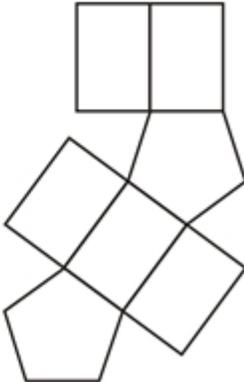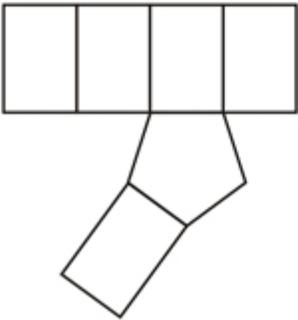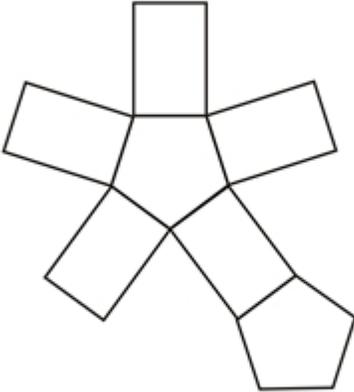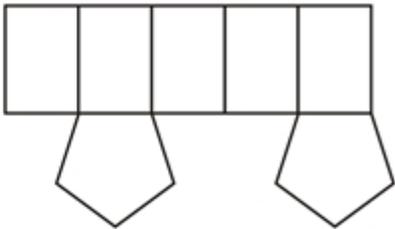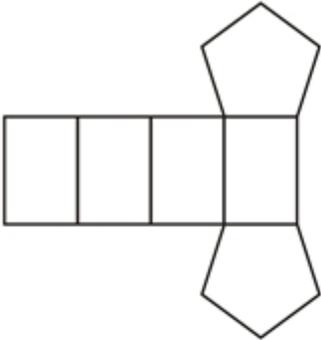
15 This table shows information about four solid shapes.

Complete the table.

One has been done for you.

	number of **flat** surfaces	number of **curved** surfaces
sphere	0	1
cone		
cuboid		
cylinder		

2 marks

16 Here are four diagrams.

On each one put a tick (✓) if it is a net of a cube.
Put a cross (✗) if it is not.
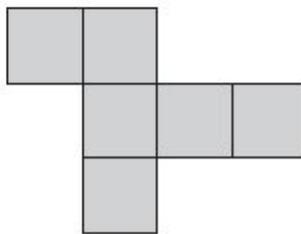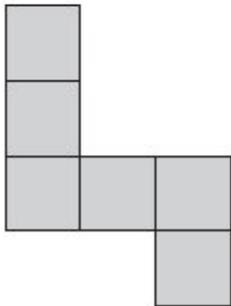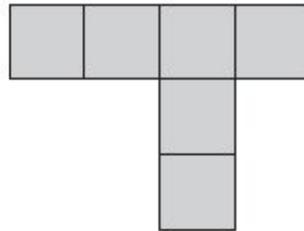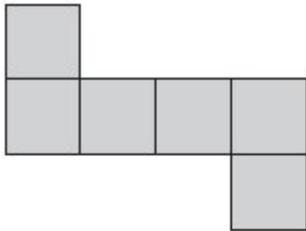
2 marks

17 Here is a cube.

The cube is shaded all the way round so that the top half is grey and the bottom half is white.
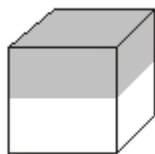
Here is the net of the cube.

Complete the shading.
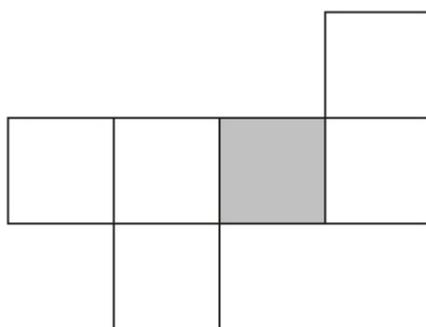
2 marks

18   Emily has 6 cubes.

She sticks them together to make this model.
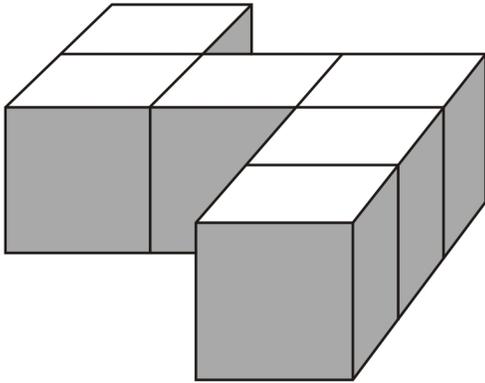
She paints the sides of the model grey all the way round.

She leaves the top and the bottom of the model white.

How many of the cubes in the model have **exactly two** faces painted grey?

1 mark

19   A cube has shaded shapes on three of its faces.
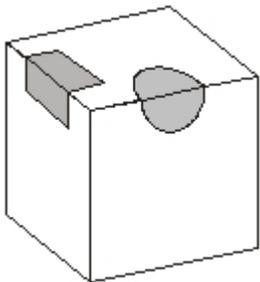
Here is a net of the cube.

Draw in the two missing shaded shapes.
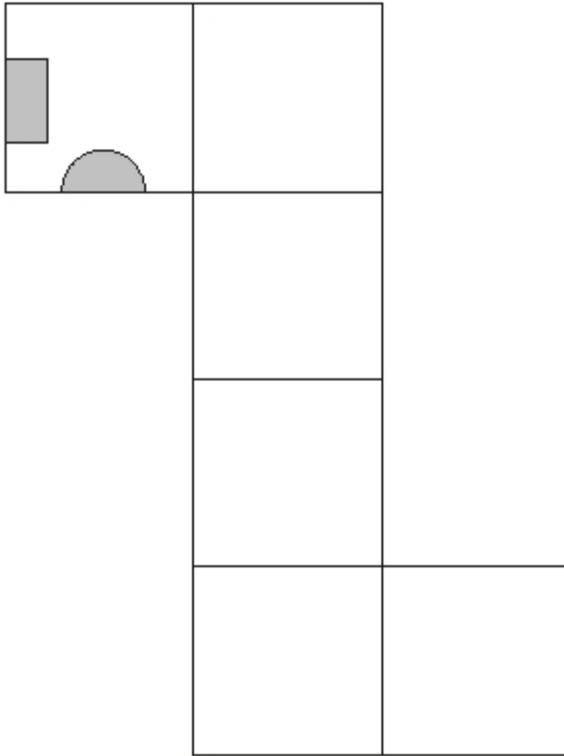
20 Here are some nets of shapes.

For each net, put a tick (✓) if it folds to make a **pyramid**.
Put a cross (✗) if it does not.
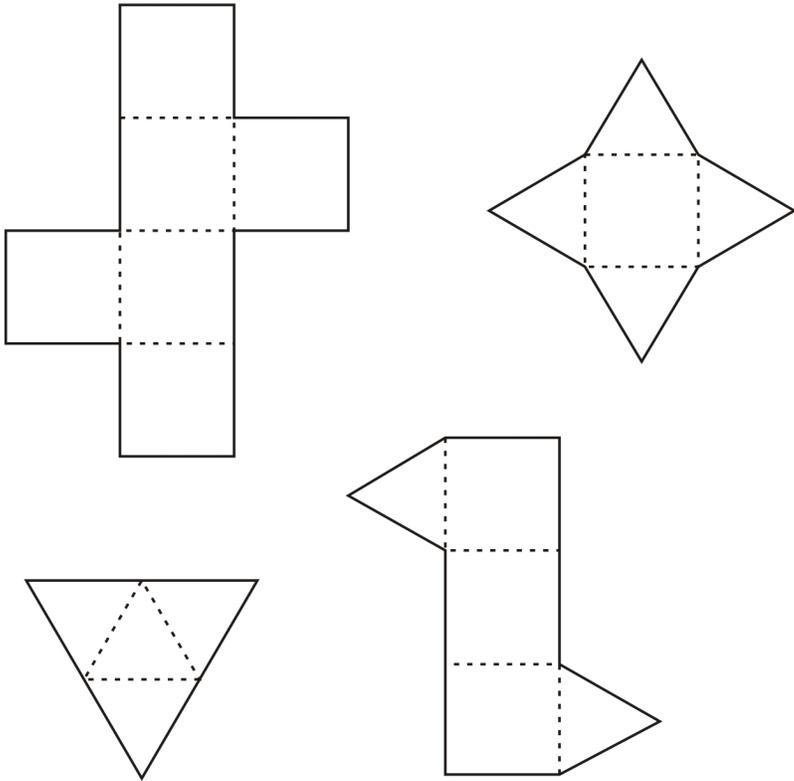
21 Cubes have been stuck together to make this block.

The block has a pattern on two faces.
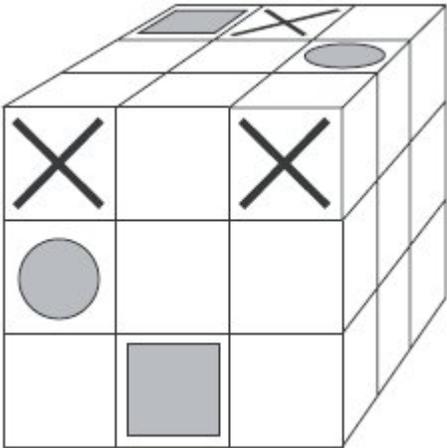
The block is turned to the position below.

Draw the missing parts of the pattern on it.
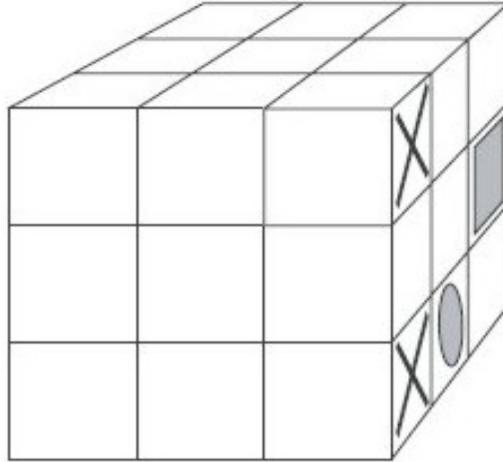
2 marks

22 Cleo has **24** centimetre cubes.

She uses all 24 cubes to make a cuboid
with dimensions **6** cm, **2** cm and **2** cm.
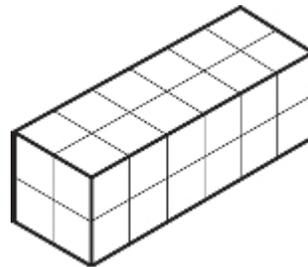
Write the dimensions of a **different** cuboid she can make using all 24 cubes.

_____ cm, _____ cm and _____ cm

1 mark

Jon has **20** centimetre cubes.

He wants to make a cube with edges that are **3** cm long.

How many **more** centimetre cubes does he need?

more

1 mark

23 Here are diagrams of some 3-D shapes.

Tick each shape that has the same number of faces as vertices.
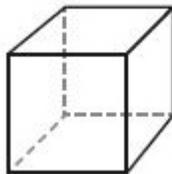
Cube ☐
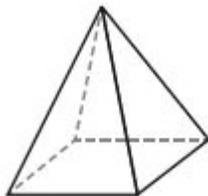
Square-based pyramid ☐
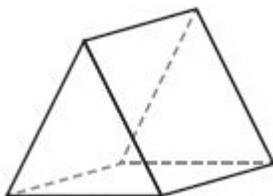
Triangular prism ☐
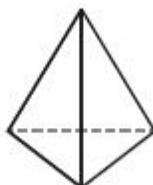
Triangular-based pyramid ☐

2 marks

24 Mina thinks of a 3-D shape.

She says,

'*It has 5 faces.*
Two opposite faces are triangles.
The other faces are rectangles.'

What is the name of the 3-D shape?

_____

1 mark

25 Seb has some cubes with a cross on each face and some cubes with a circle on each face.
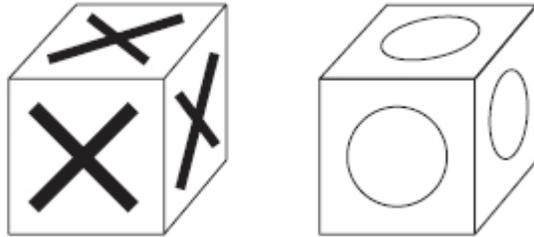
He sticks five cubes together to make this shape.
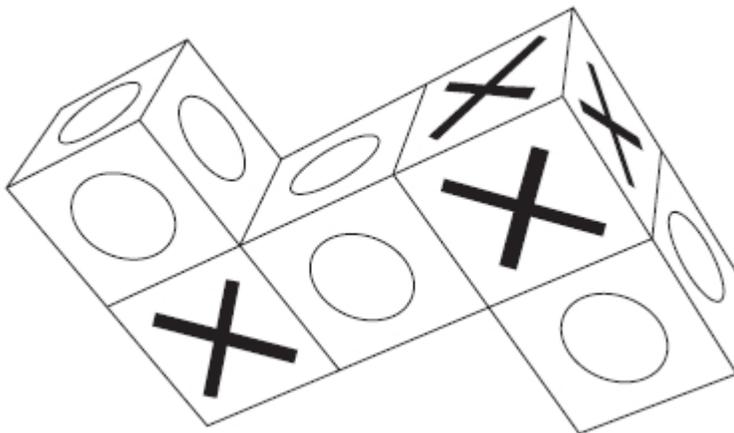
How many crosses and how many circles are there on the **outside** of the shape?

Number of crosses

1 mark

Number of circles

1 mark

26 Here is a drawing of a cube on an isometric grid.

Draw a cuboid that has:

- the **same** volume

- **half** the height.
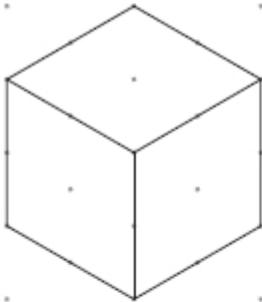
2 marks

27 Here are three nets of a cube.

On each net draw **one more dot** so that each cube will have dots on **opposite** faces.
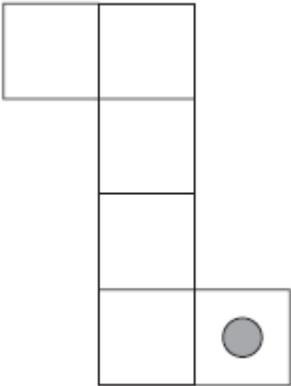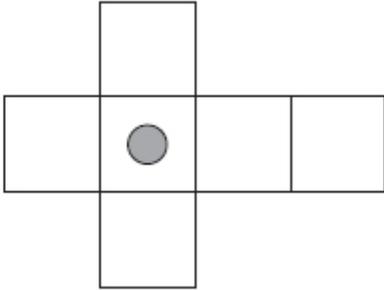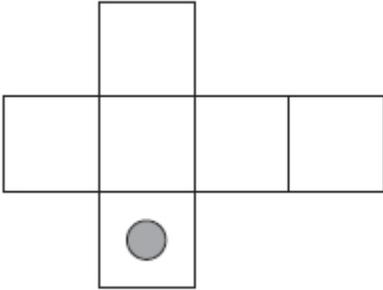
2 marks

28 Megan uses four cubes to make this cuboid.
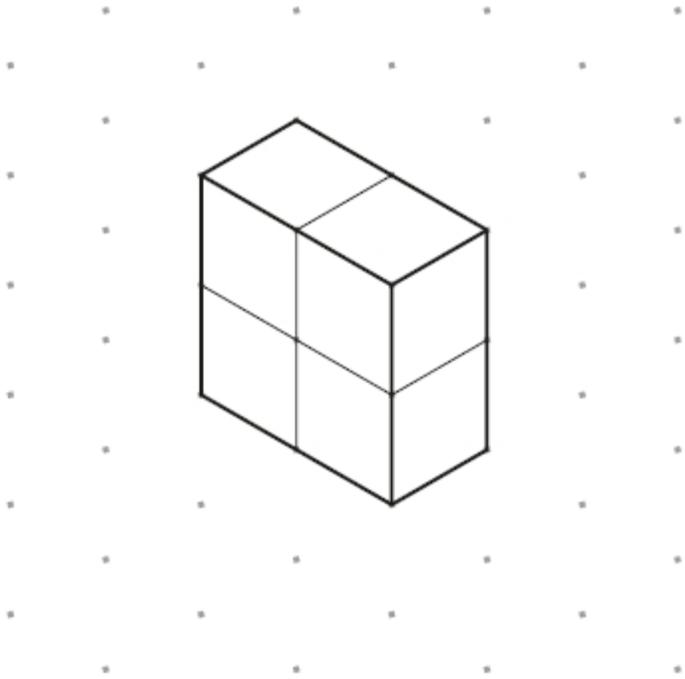
Then she takes one cube away, leaving the other cubes where they are.

Draw what the new shape could be.
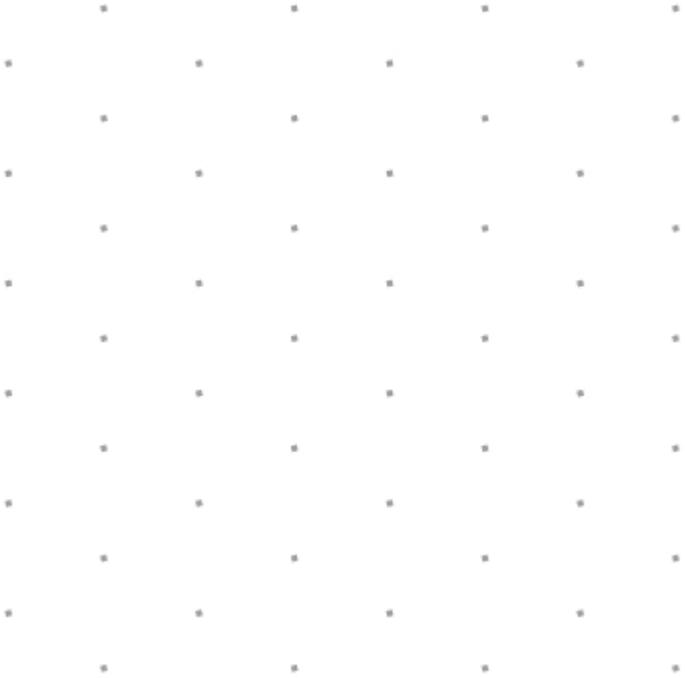
1 mark

29 Jack has two **square-based pyramids** that are the same size.

He sticks the square faces together to make a new 3-D shape.

How many **faces** and how many **edges** does his new 3-D shape have?

| faces | and | edges |

30 Here is a cube.

The top half of the cube has been shaded all the way round.
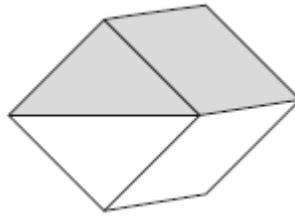
Here is a net for the cube.

One square has been shaded for you.

Shade more of the net so that it could fold to make the cube above.
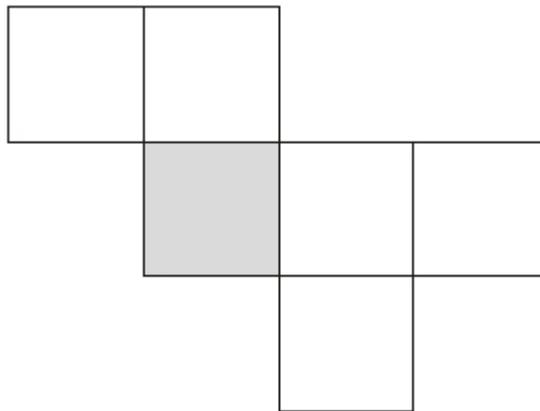
31 Look at the cuboid below.

4 cm

2 cm

2 cm
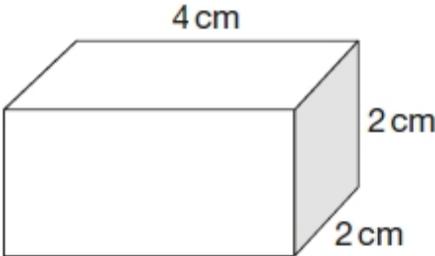
Draw **two** more faces to complete the net of the cuboid.
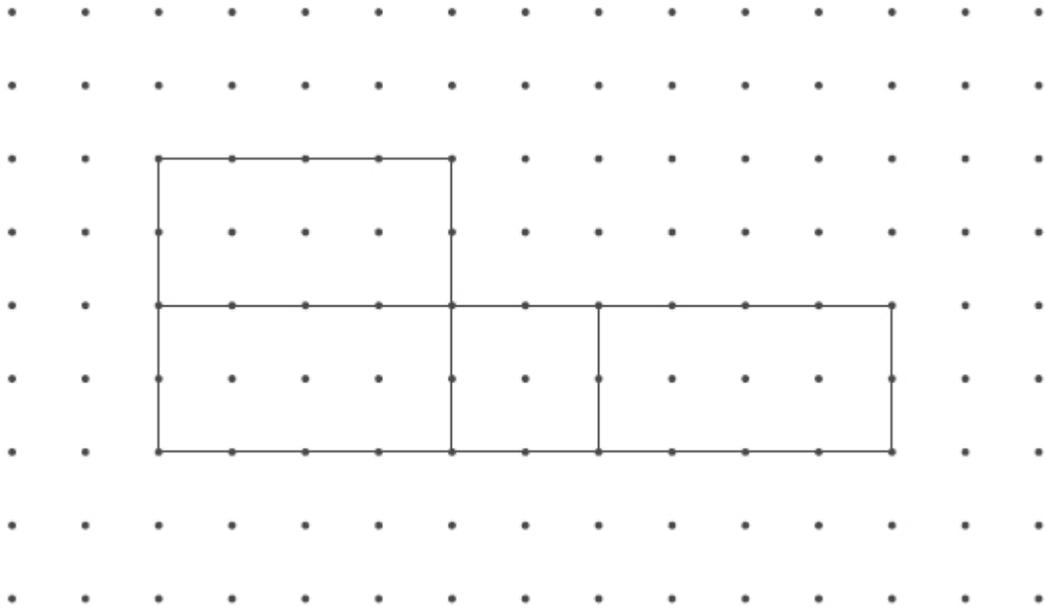
2 marks

32 Emma makes a cuboid using 12 cubes.
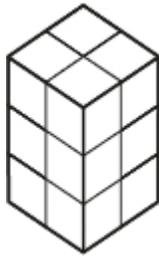
Write the letter of the cuboid that has a **different** volume from Emma's cuboid.
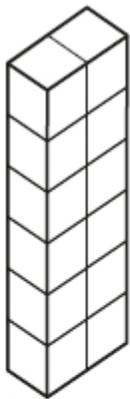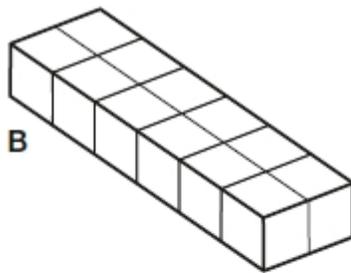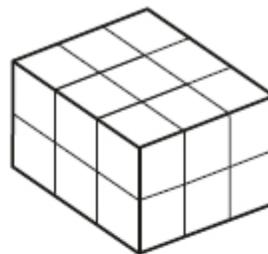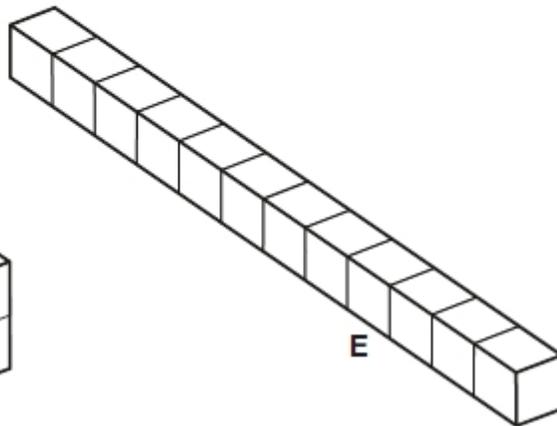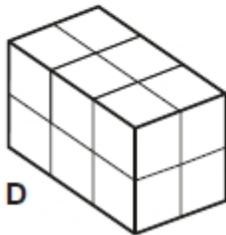
1 mark

33 This shape is made of wooden centimetre cubes.

Not actual size

3 cm

5 cm

5 cm
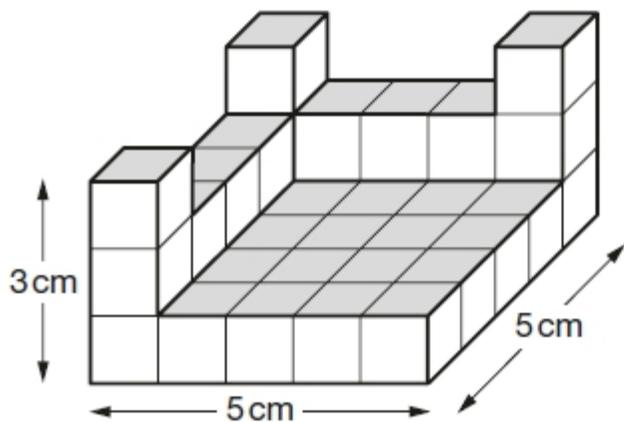
How many **more** centimetre cubes are needed to make it into a solid cuboid 3 cm tall, 5 cm long and 5 cm wide?

1 mark

Mark schemes

1 Table completed as shown:

	number of faces	number of edges
cuboid	6	12
square-based pyramid	5	8

[1]

2

✓ ✗ ✓ ✓

Award **TWO** marks for all four boxes correct. Award **ONE** mark if only three boxes correct.

Each box must have a tick or a cross.

A blank box counts as incorrect, unless answer is indicated unambiguously elsewhere on the page.

Up to 2

[2]

3 pyramid

Accept square pyramid.
Accept misspellings.

[1]

4 1 mark for drawing all arrows as shown.
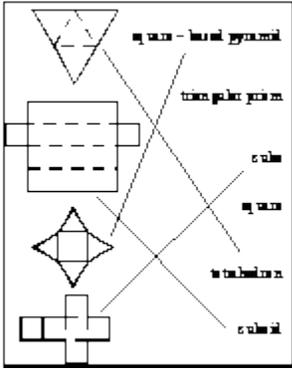
Do not award the mark if the child draws additional lines unless he or she clearly indicates which three are correct.

[1]

5
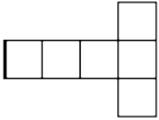
All 5 fold lines correctly drawn for 1 mark.

Allow plus or minus 2 millimetres.

[1]

6 Award **TWO** marks for a correct answer as shown below:
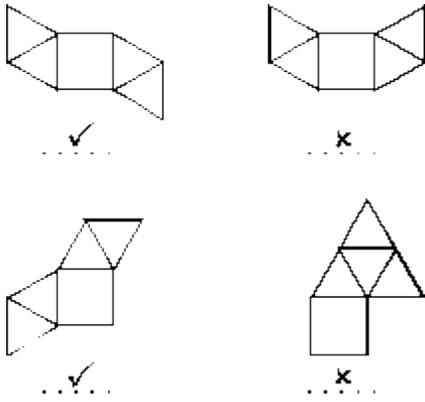
If the answer is incorrect, award **ONE** mark for three boxes correctly ticked or crossed **OR** two boxes correctly ticked and the other two boxes left blank.

Accept alternative, unambiguous indications, eg 'Y' or 'N'.

Up to 2

[2]

7 Diagram marked as shown:
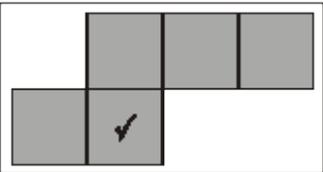
Accept alternative, unambiguous indications, such as a cross in the square shown above.

U1

[1]

8 Both circles drawn on faces as shown:
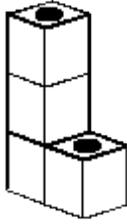
The size and accuracy of the circles is unimportant, provided the correct faces are indicated.

[1]

9 Diagram marked as shown:
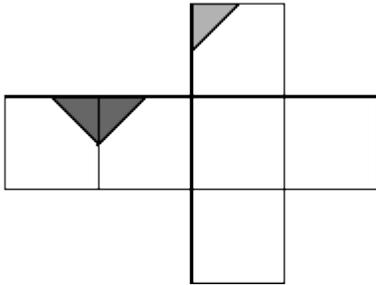
Both triangles must be correctly marked.

Accept slight inaccuracies in drawing, provided the intention is clear.

Triangles need not be shaded.

[1]

10 Two nets ticked as shown:
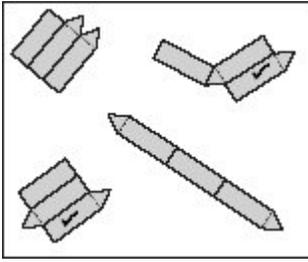
> ***Both*** *nets must be ticked for the award of the mark.*
>
> *Accept any other clear way of indicating the two correct nets, such as circling.*

[1]

11 Draws a correct view of the prism in any orientation, using the isometric grid, eg:

•

•
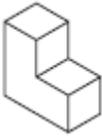
2

or

Draws a correct view, using the isometric grid, but the only error is either to omit one external line or to show some incorrectly indicated hidden lines, eg

•
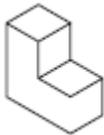
OR

Draws a view of a prism with an L-shaped cross section, using the isometric grid with all external lines and no incorrectly indicated hidden lines shown, but with incorrect dimensions

OR

Shows an understanding that the net forms a prism with an L-shaped cross-section, showing all external lines and no incorrectly indicated hidden lines, but does not use the isometric grid, eg

•

OR
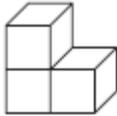
Draws a correct view of the cross-section, using the isometric grid, eg

•
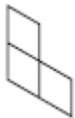
1

Accept some or all internal lines drawn, eg

•
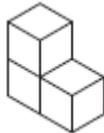
! Lines not ruled or accurate
Accept provided the pupil's intention is clear
! Extended edges
Condone
! Prism enlarged
For 2 m or 1 m, accept provided a consistent scale factor has been used for all lengths
! For 2 m, some or all hidden lines shown
Do not accept unless hidden lines are dotted or otherwise shown as hidden
eg, do not accept

•

Do not accept for 2 m, any external line omitted

! For 1 m, L-shaped cross-section

The cross-section must have a line of symmetry eg, for 1 m do not accept

-

! For 1 m, additional lines shown with correct cross-section

Ignore

[2]

12 Diagram completed as shown:
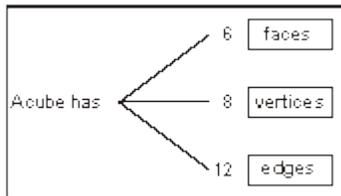
All three words must be correctly placed for the award of the mark.

Accept any other clear way of indicating the correct words for the boxes, such as matching.

Accept any reasonable spellings, provided the intention is clear.

[1]

13 Diagram completed with **ONE** of the four extra squares shown.
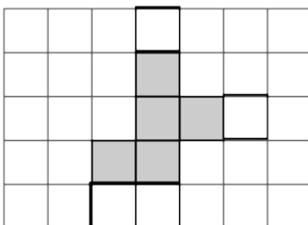
Accept slight inaccuracies in drawing provided the intention is clear.

Accept alternative indications, eg squares ticked or circled.

*Accept more than one square drawn if **all** are correct.*

[1]

14 One net ticked as shown:
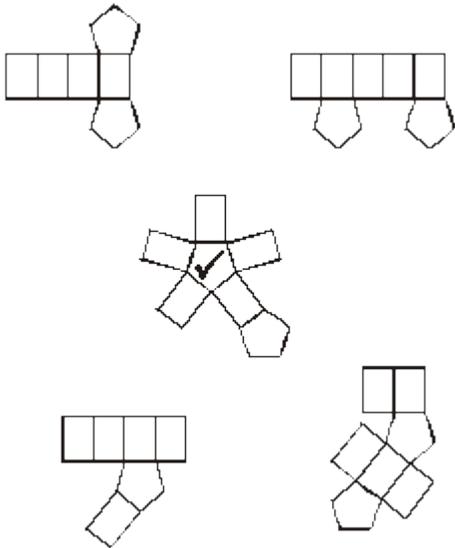
> *Accept alternative unambiguous indications of the correct shape,*
> *provided the intention is clear,*
> *eg net circled*

[1]

15 Award **TWO** marks for table completed correctly as shown:

	number of **flat** surfaces	number of **curved** surfaces
sphere	0	1
cone	1	1
cuboid	6	0
cylinder	2	1

If the answer is incorrect, award **ONE** mark for two out of three rows completed correctly.

> *Accept a blank box for '0'.*

Up to 2

[2]

16 Award **TWO** marks for diagrams ticked or crossed as shown:
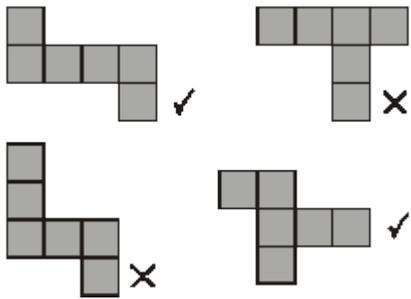
If the answer is incorrect, award **ONE** mark for three diagrams ticked or crossed correctly.

*Accept alternative unambiguous indications such as **Y** or **N**.*

*For **TWO** marks accept:*
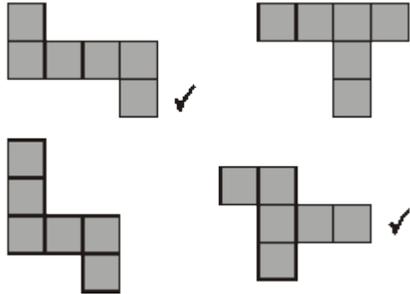
Up to 2

[2]

17 Award **TWO** marks for four faces correctly shaded as shown:
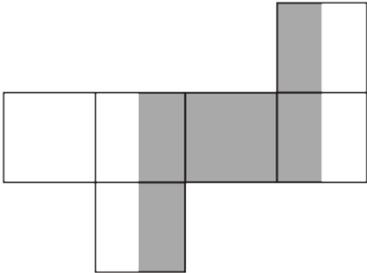
If the answer is incorrect, award **ONE** mark for:

- only the correct four faces marked **AND** at least two shaded correctly

  OR

- four faces shaded correctly **AND** one shaded incorrectly

  OR

- three faces shaded correctly **AND** none shaded incorrectly.

> *The width of each shaded rectangle is irrelevant provided the intention is clear.*

Up to 2 (U1)

[2]

| 18 | 4 |

U1

**[1]**

| 19 | Diagram completed as shown: |
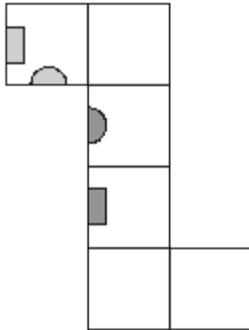
> *Accept: inaccuracies in drawing provided the intention is clear.*
> *Shapes need not be shaded.*

[1]

20 Nets ticked and crossed as shown:
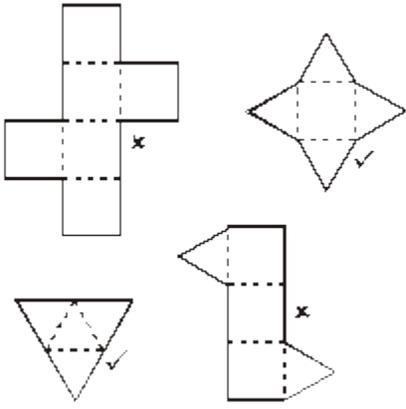
Accept alternative unambiguous indications of the correct nets, eg nets circled or crossed out.

Accept:
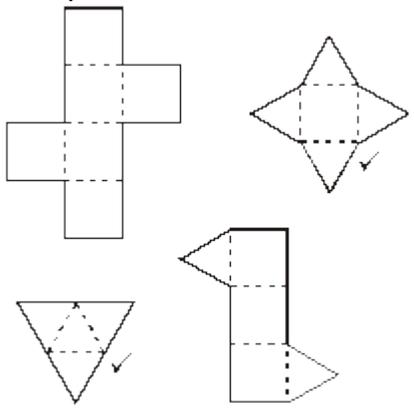
[1]

21 Award **TWO** marks for the diagram completed as shown:
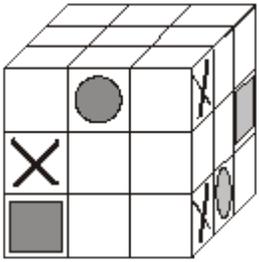
Accept slight inaccuracies in drawing provided the intention is clear.

Circle and square need not be shaded.

If the answer is incorrect, award **ONE** mark for two shapes correct and no more than one incorrect.

Up to 2

[2]

22 (a) Gives three integers other than 2, 2, 6 (in any order) whose product is 24, eg:

- 1, 1, 24

- 1, 24, 1

- 1, 2, 12

- 1, 3, 8

- 1, 4, 6

- 2, 3, 4

  ! Non-integer(s) used

  As this shows understanding of volume, condone provided the three values given have a product of 24

  eg, accept

  - *1.5, 2, 8*

  1

(b) 7

  1

  [2]

23 Award **TWO** marks for both pyramids ticked as shown:
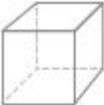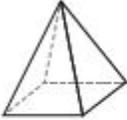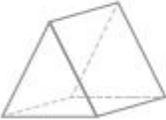
Shape		
Cube		☐
Square-based pyramid		☑
Triangular prism		☐
Triangular-based pyramid		☑

Accept alternative unambiguous positive indications, e.g. Y.

If the answer is incorrect, award **ONE** mark for:

- the two pyramids and not more than one incorrect shape ticked

OR

- only one correct shape ticked and no incorrect shape ticked.

Up to 2m

[2]

24 Triangular prism

Accept recognisable misspellings.
Accept prism.

[1]

25 (a)   8

1

(b)   14

1

*If the answer to (a) is 14 **AND** the answer to (b) is 8, then award **ONE** mark for (b).*

U1

[2]

26 Draws a cuboid with a height of 1 cm and a volume of 8 cm³ in any orientation, using the isometric grid, eg:

-

-
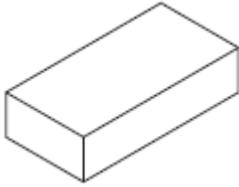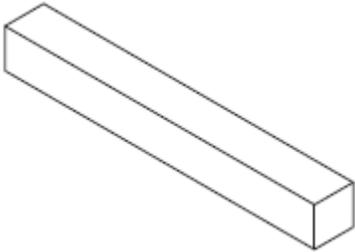
2

or

Draws a cuboid with unambiguous indication of the correct dimensions, but the only error is not to use the isometric grid correctly or omits an external line and/or includes some hidden lines, eg:

-

-
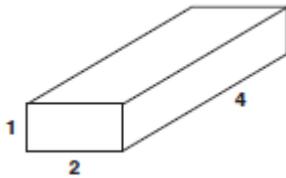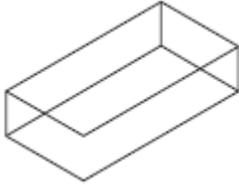
1

Accept lines not ruled or accurate
Accept slight inaccuracies in drawing
! Extended lines
*For 2 m or 1 m, condone*
*! Internal lines drawn*
Ignore, eg:
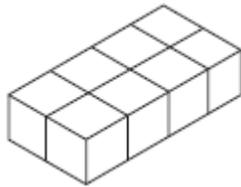
! Hidden lines drawn
Do not accept *for 2 m, unless hidden lines are dotted or otherwise shown as hidden.*
Accept hidden lines for 1 m, eg:
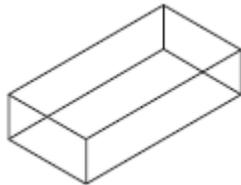
! An external line omitted
Do not accept *for 2 m. Accept for 1 m if intended shape is clear, eg:*
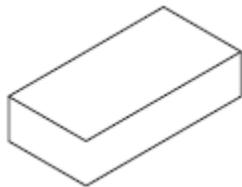
! Ignore incomplete drawings
*! Vertices not at dots*
Do not accept for 2 m, but accept for 1 m

1

[2]

27 Award **TWO** marks for three diagrams completed as shown:
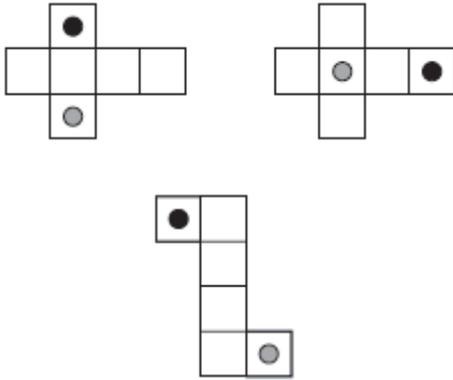
*Accept alternative unambiguous indications.*

If the answer is incorrect, award **ONE** mark for two diagrams correct.

Up to 2
U1

[2]

28 Draws a correct view of the new cuboid using the isometric grid, eg:

-

-

-

-
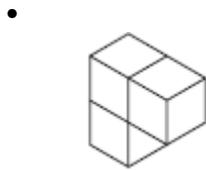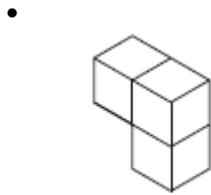
  Accept lines not ruled or accurate

  Accept slight inaccuracies in drawing

  Accept alternative orientation, eg:

  -
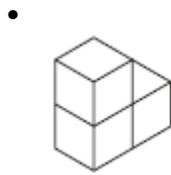
  Accept some or all internal lines omitted, eg:

  -
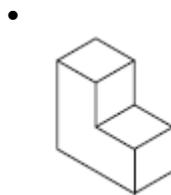
  ! Some or all hidden lines drawn

  Do not accept *unless hidden lines are dotted or otherwise shown as hidden*

  ! Extended edges

  Condone

  ! Ignore incomplete drawings

 **Do not accept** *external lines omitted*

  [1]

29	8 faces and 12 edges

[1]

**30** Shades three faces only, to complete the net correctly, ie:

-

-

-

-
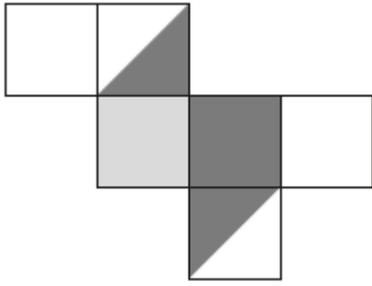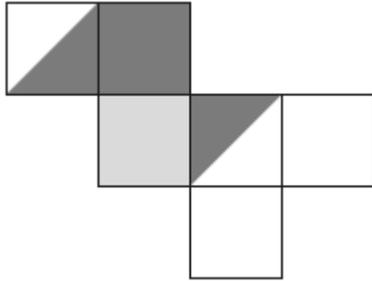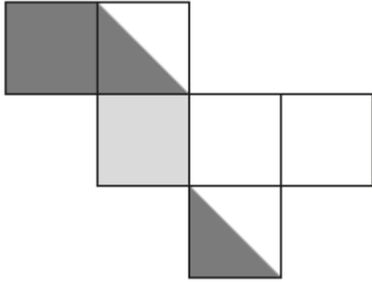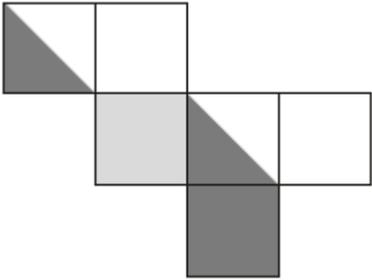
> *!   Shape not shaded*
> *Accept any unambiguous identification provided the intention is clear*

2

or

Shades at least **two** faces correctly with no more than **one** face shaded incorrectly, eg:

-

-
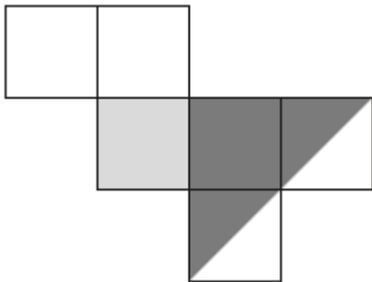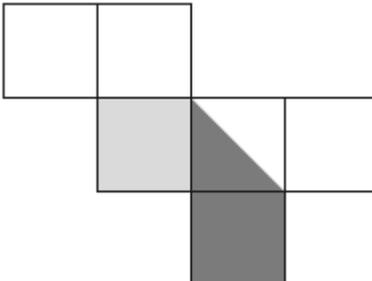
1

[2]

31 (a) Rectangle (oblong) drawn in one of the correct positions as shown
in diagram below:

1

(b) Square drawn in one of the correct positions as shown in the diagram below:
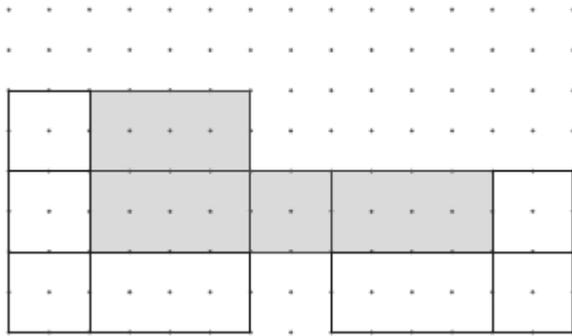
*Only accept a square that is joined to the side of an adjacent
rectangle (oblong).*

1

[2]

32 C

Accept 18.

[1]

33 38

[1]