# GCSE Foundation 16

*Shape, space and measure*

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103 minutes

95 marks

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*Geometric reasoning*

**Q1.** (a) Measure the length of line $AB$.

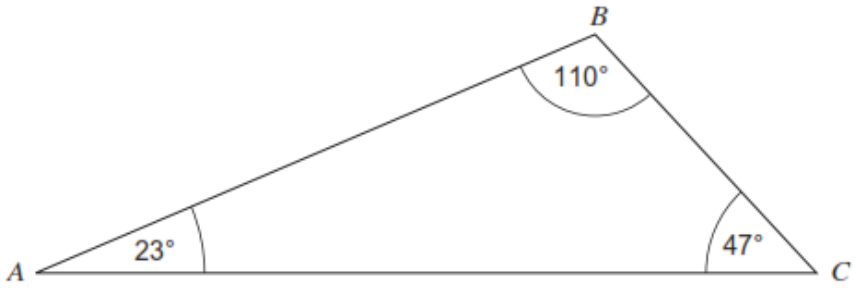

Answer ..... cm

**(1)**

(b) Mark the midpoint of line $CD$ with a cross (×).


**(1)**
**(Total 2 marks)**

**Q2.** The diagram shows a triangle $ABC$.




(a) Circle the correct word to describe triangle $ABC$.

Scalene Isosceles Equilateral

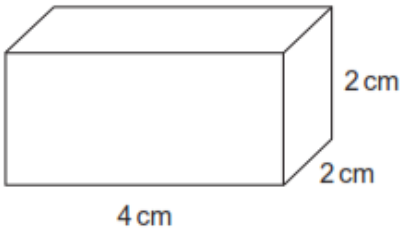
**(1)**

(b) Circle the correct word to describe angle $B$.

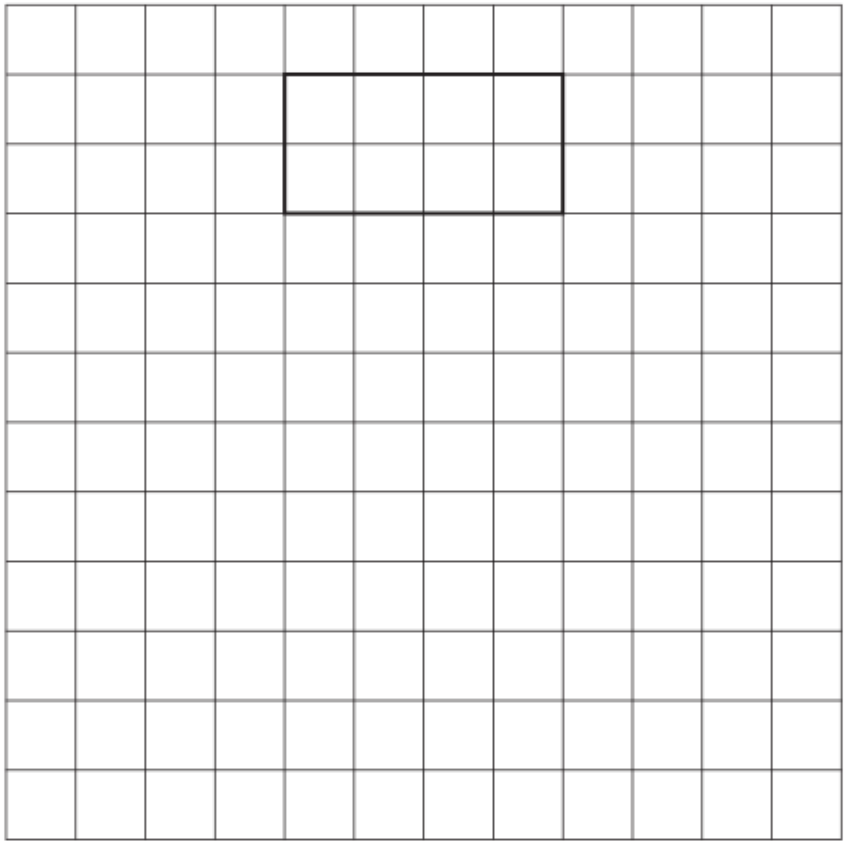
Acute Obtuse Reflex

**(1)**
**(Total 2 marks)**

**Q3.** The diagram shows a cuboid.

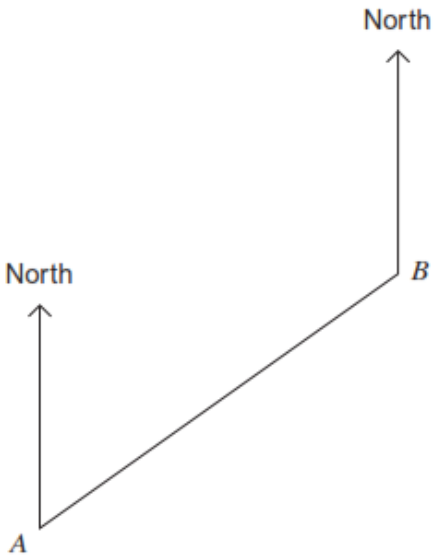



On the centimetre grid, complete a possible net for the cuboid.
One face has been drawn for you.



**(Total 3 marks)**

**Q4.** $A$ and $B$ are two towns.




(a) Measure the bearing of $B$ from $A$.

Answer ..... °

**(1)**

(b) Natasha says, "To work out a bearing in the opposite direction,

add 180° to the original bearing."

Use your answer to part (a) and Natasha's method to work out the bearing of $A$ from $B$.

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Answer ..... °

**(2)**

(c) Give a reason why Natasha's method can only be used for bearings up to 180°.

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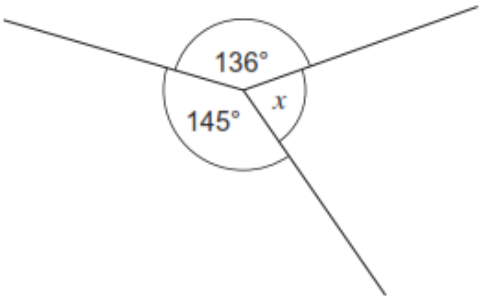
**(1)**

**(Total 4 marks)**

**Q5.** (a) The diagram shows three angles at a point.




Not drawn accurately

Work out the value of $x$

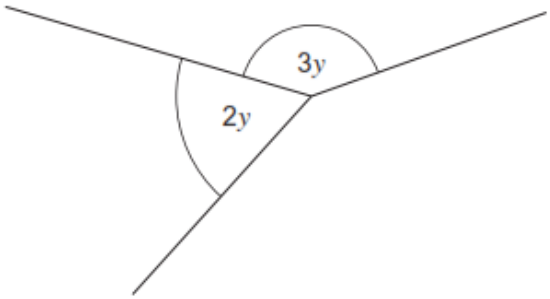
.....

.....

Answer ..... degrees

**(2)**

(b) This diagram also shows three angles at a point.




Not drawn accurately

Work out the missing angle in terms of $y$.
Give your answer in its simplest form.

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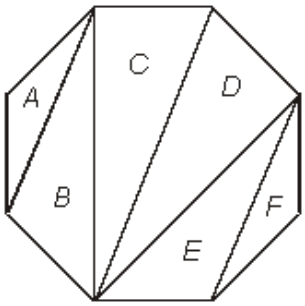
Answer ..... degrees

**(2)**
**(Total 4 marks)**

**Q6.** A regular octagon is split into triangles *A, B, C, D, E* and *F*.



(a) Complete this list of pairs of congruent triangles.

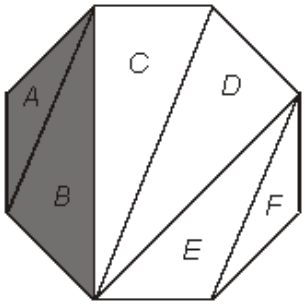
*C* and *D*

*B* and .....

*A* and .....

**(2)**

(b) Triangles A and B make a trapezium as shown.



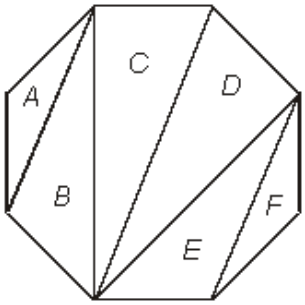

Which of the following triangles also make a trapezium?

Circle your answers.

B and C C and D D and E E and F

**(2)**

(c) Shade **two** triangles in this diagram to make a kite.

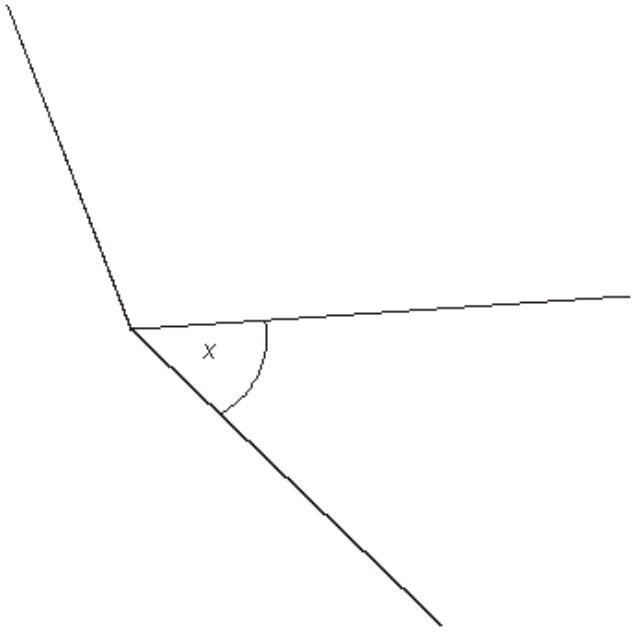



**(1)**

**(Total 5 marks)**

**Q7.** Viki is cutting angles out of paper to fit together exactly at a point as shown.

She cuts out an acute angle, an obtuse angle and a reflex angle.




(a) Measure the size of the acute angle, marked *x*, on the diagram.

Answer ..... degrees

**(1)**

(b) Viki starts again using three different angles.

Choose three different angles, one acute, one obtuse and one reflex, which fit together exactly at a point.

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Answer Acute = ..... degrees

Obtuse = ..... degrees

Reflex = ..... degrees

**(3)**

**(Total 4 marks)**

**Q8.** (a) An isosceles triangle has one angle of 80°.

Write down the possible sizes of the other two angles.

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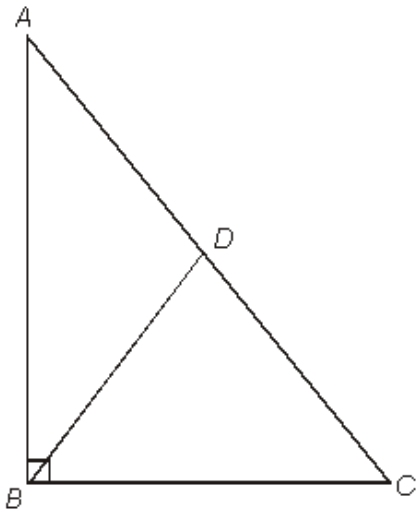
Answer ..... and ..... degrees

or ..... and ..... degrees

**(2)**

(b) Triangle *ABC* is a right-angled triangle.

*BDC* is an equilateral triangle.




Not drawn accurately

Show that triangle *ABD* is an isosceles triangle.

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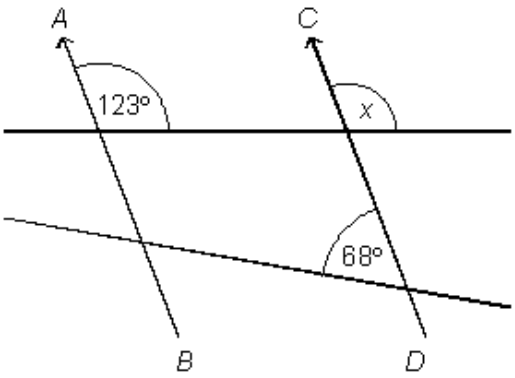
**(3)**
**(Total 5 marks)**

**Q9.** In the diagram, *AB* is parallel to *CD*.




Not drawn accurately

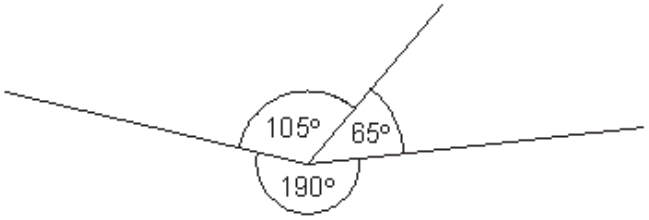
Write down the value of *x*.
Give a reason for your answer.

Answer ..... degrees

Reason .....

**(Total 2 marks)**

**Q10.** (a) Three angles are drawn at a point.




Not drawn accurately

(i) Write down the size of the acute angle.

Answer ..... degrees

**(1)**

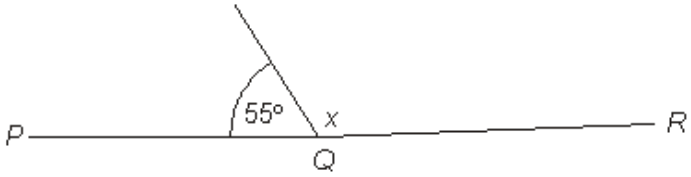
(ii) Write down the size of the obtuse angle.

Answer ..... degrees

**(1)**

(b) In the diagram, angle *x* is 115°.

Not drawn accurately




Explain why *PQR* is **not** a straight line.

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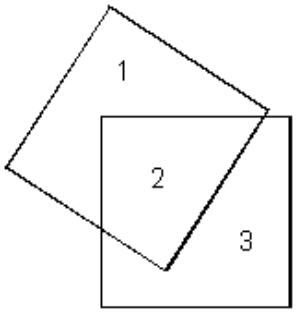
**(2)**
**(Total 4 marks)**

**Q11.** The diagram shows two overlapping squares that are the same size.
Three regions are formed.



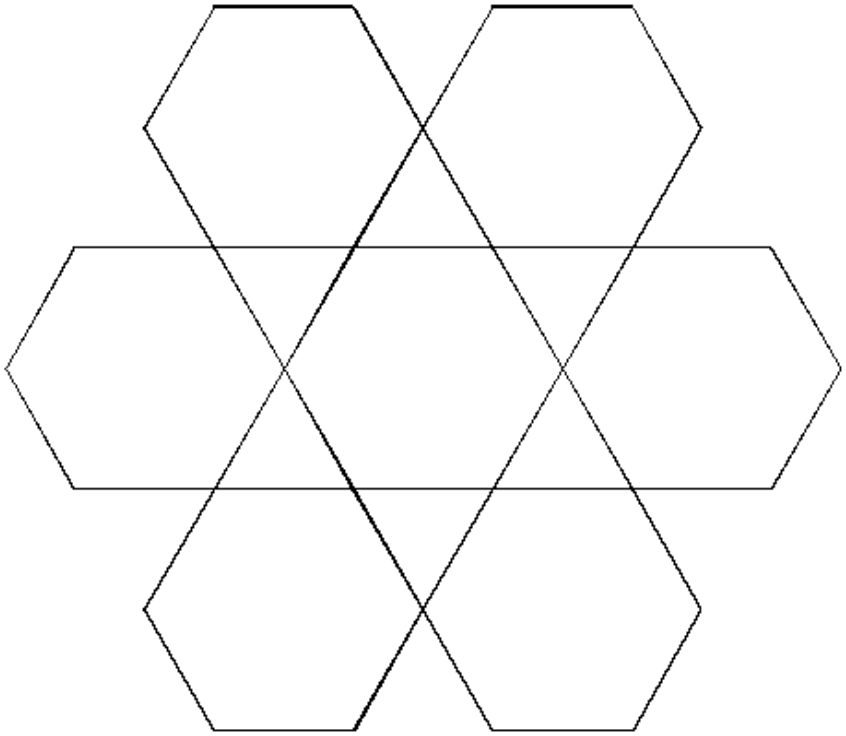

What is largest number of regions that can be formed by two overlapping squares that are the same size?
Draw a diagram to show your answer.

Answer .....

**(Total 4 marks)**

**Q12.** Shapes tessellate when they fit together with no gaps.
Here is a tessellating pattern made from equilateral triangles and regular hexagons.

Not drawn accurately



(a) Write down the size of each interior angle in the equilateral triangle.

Answer ..... degrees

**(1)**

(b) Write down the size of each interior angle in the regular hexagon.

Answer ..... degrees

**(1)**

(c) Use your answers to parts (a) and (b) to explain why the two shapes form a tessellating pattern.

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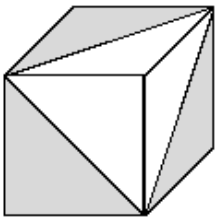
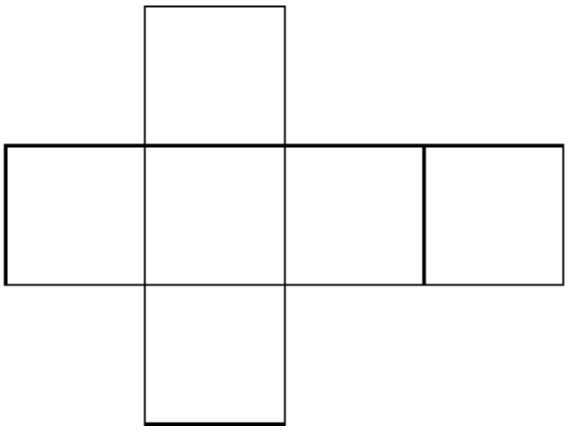
**(3)**
**(Total 5 marks)**

**Q13.** Three faces of this cube have shaded triangles on them.
The other three faces are blank.



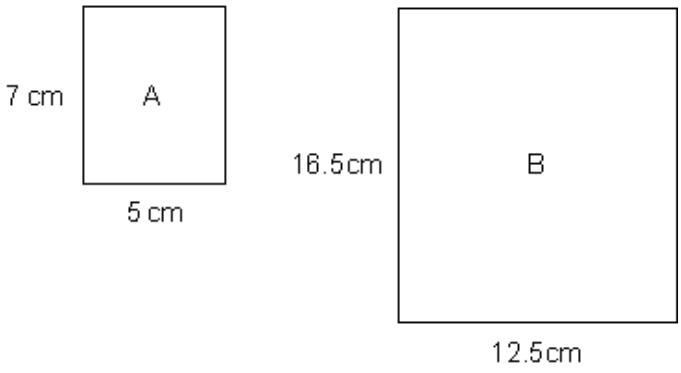
Here is a net of the cube.



Draw the shaded triangles on the net.

**(Total 3 marks)**

**Q14.** Here are two rectangles, A and B.




Not drawn accurately

Is rectangle B an enlargement of rectangle A?

Tick the correct box.

☐ Yes ☐ No

Explain your answer.

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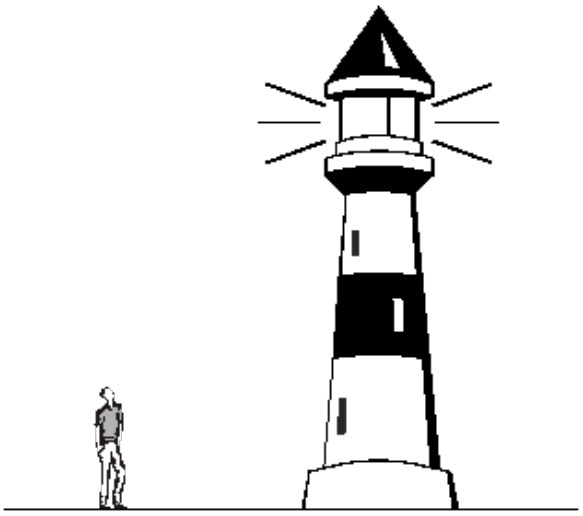
**(Total 3 marks)**

**Q15.** A builder wants to estimate the height of a lighthouse.

(a) Write down a sensible estimate for the height of a man.
Give your answer in metres.

Answer ..... m

**(1)**



(b) Use your answer to part (a) to estimate the height of the lighthouse.

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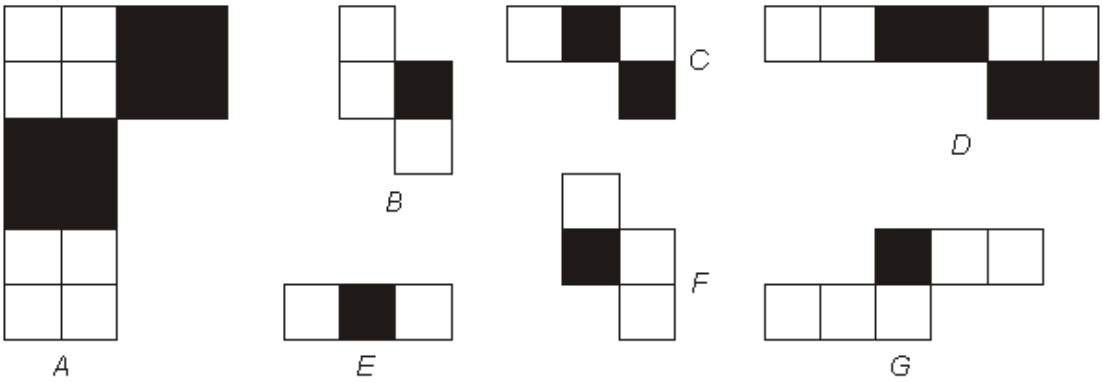
Answer ..... m

**(2)**

**(Total 3 marks)**

**Q16.** Here are seven shapes made from small squares.




(a) Which **two** shapes are congruent?

Answer ..... and .....

**(1)**

(b) (i) Which shape is an enlargement of shape *C*?

Answer .....

**(1)**

(ii) What is the scale factor of the enlargement?

Answer .....

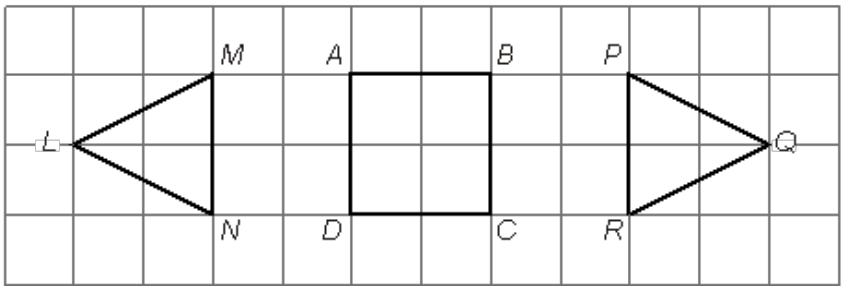
**(1)**

(c) On the grid, draw an enlargement of shape *E* by scale factor 3.

**(3)**

**(Total 6 marks)**

**Q17.** The diagram shows a square *ABCD* and two isosceles triangles *LMN* and *PQR*.




(a) Write down a line that is parallel to line *LM*.

Answer .....

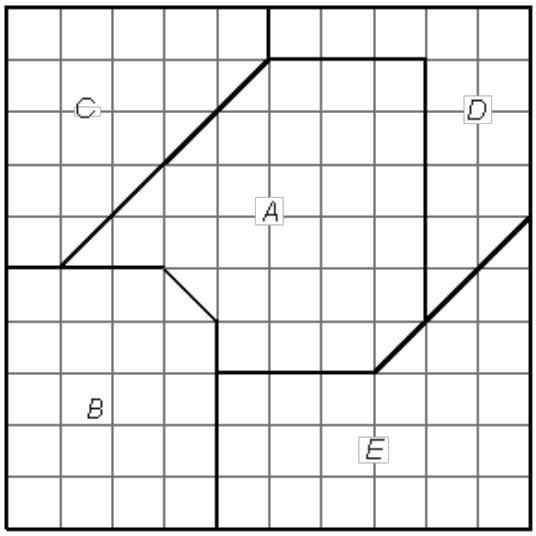
**(1)**

(b) Write down a line that is at right angles to line *MN*.

Answer .....

**(1)**
**(Total 2 marks)**

**Q18.** The diagram shows five shapes, *A, B, C, D* and *E* drawn on a grid.



Put the shapes in order of area, starting with the smallest.
The smallest and largest are done for you.

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Answer *D* ..... , ..... , ....., *A*

**(Total 2 marks)**

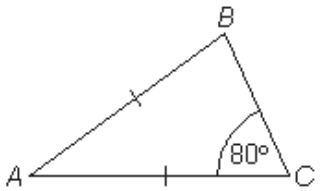
**Q19.** Seven coloured blocks are placed in a vertical pile.
The blocks are Red (R), Orange (O), Yellow (Y), Green (G), Blue (B), Indigo (I) and Violet (V).

The Red block is on the bottom.
The Yellow block is directly below the Indigo block.
There are two blocks between the Yellow block and the Violet block.
The Blue block is directly above the Green block.
The Violet block is touching the Red block.

Use this information to fill in the colours of the blocks.

**(Total 3 marks)**

**Q20.** (a) Triangle *ABC* is isosceles.
*AB* = *AC*
Angle *ACB* = 80°




Not drawn accurately

Work out angle *BAC*.

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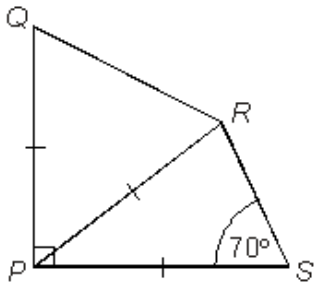
Answer .....degrees

**(2)**

(b) In the diagram
Angle *QPS* = 90°
*PQ* = *PR* = *PS*
Angle *PSR* = 70°




Not drawn accurately

Work out angle *PRQ*.

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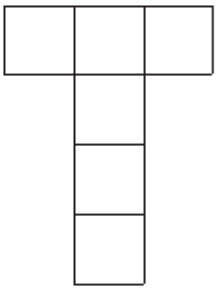
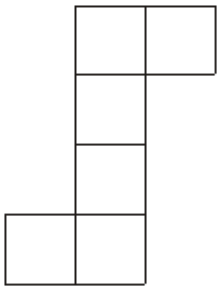
Answer .....degrees

**(3)**
**(Total 5 marks)**

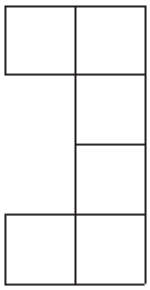
**Q21.** Which **three** of the following are nets of a cube?



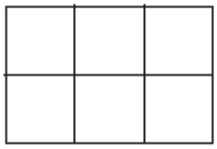
A



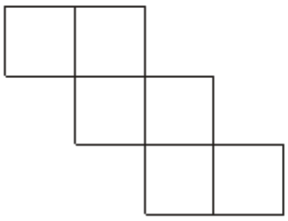
B



C



D



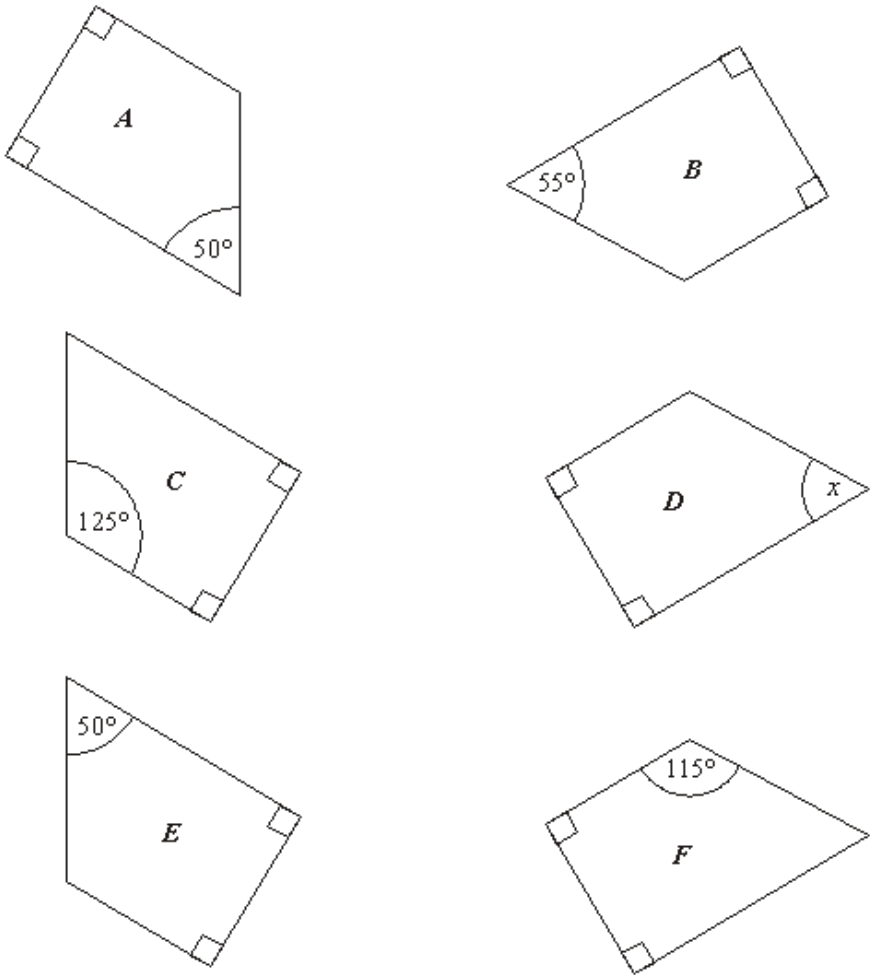
E

Answer .....

**(Total 2 marks)**

**Q22.** Rebecca has three rectangular sheets of paper.
She cuts each sheet into two pieces.
She now has the six pieces, ***A*** to ***F***, shown below.

Not drawn accurately




(a) Which piece is part of the same rectangle as ***A***?

Answer .....

**(1)**

(b) Which piece is part of the same rectangle as ***B***?

Answer .....

**(1)**

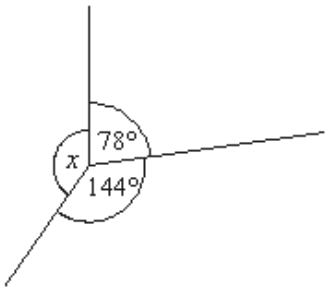
(c) Calculate the size of angle *x* on piece ***D***.

.....

Answer *x* = ..... degrees

**(2)**
**(Total 4 marks)**

**Q23.** (a)




Not drawn accurately

(i) What types of angle are 78° and 144°?

Answer 78° is .....

144° is .....

**(2)**

(ii) Work out the value of *x*.

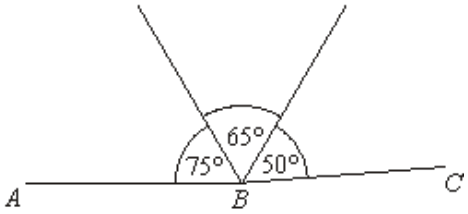
.....

.....

Answer *x* = ..... degrees

**(2)**

(b)




Not drawn accurately

Jasmine says that if this diagram was drawn accurately then *ABC* would be a straight line.
Is she right?
You **must** explain your answer.

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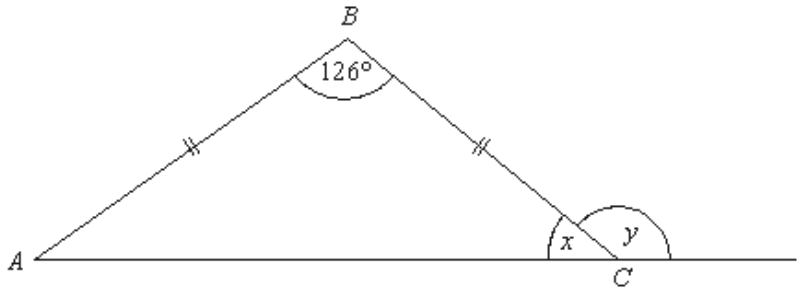
**(2)**
**(Total 6 marks)**

**Q24.** *ABC* is an isosceles triangle.
*AB* = *BC*

Not drawn accurately




Work out the values of *x* and *y*.

.....

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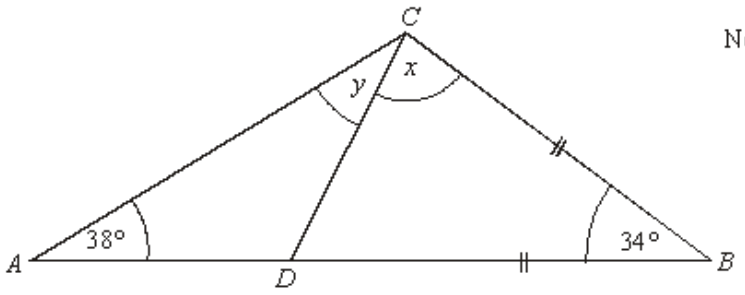
.....

Answer *x* = ..... degrees

*y* = ..... degrees

**(Total 3 marks)**

**Q25.** *ABC* is a triangle.
*D* is a point on *AB* such that *BC* = *BD*.




Not drawn accurately

(a) Work out the value of *x*.

.....

.....

Answer ..... degrees

**(2)**

(b) Work out the value of $y$.

.....

.....

Answer ..... degrees

**(2)**

(c) Does $AD = DC$?
Give a reason for your answer.

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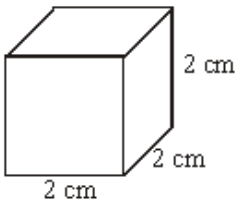
**(1)**
**(Total 5 marks)**

**Q26.** The diagram shows a cube of side 2 cm.

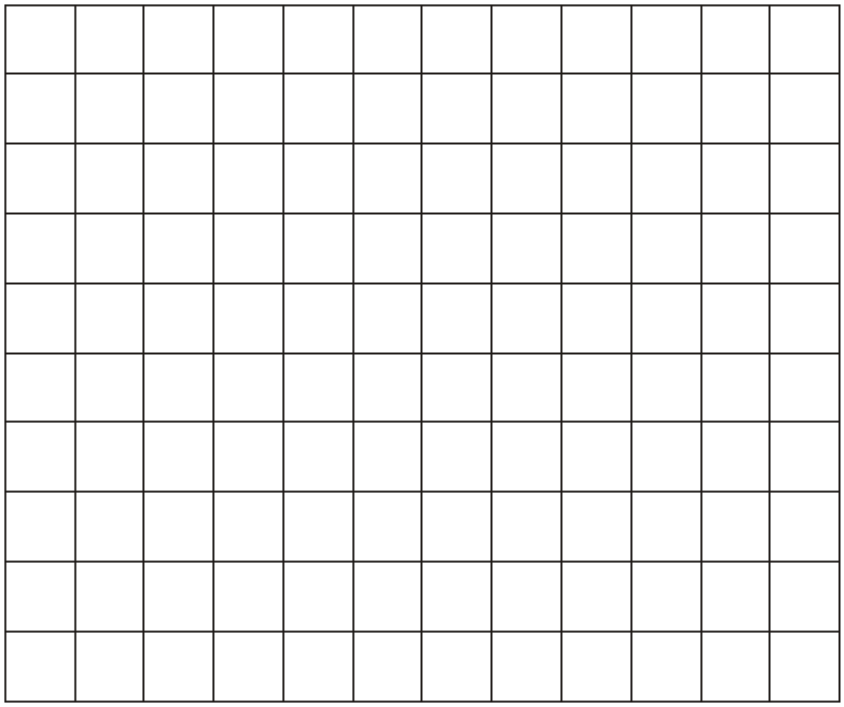



(a) How many faces does a cube have?

Answer .....

**(1)**

(b) Draw an accurate net of this cube on the grid below.



**(3)**
**(Total 4 marks)**