

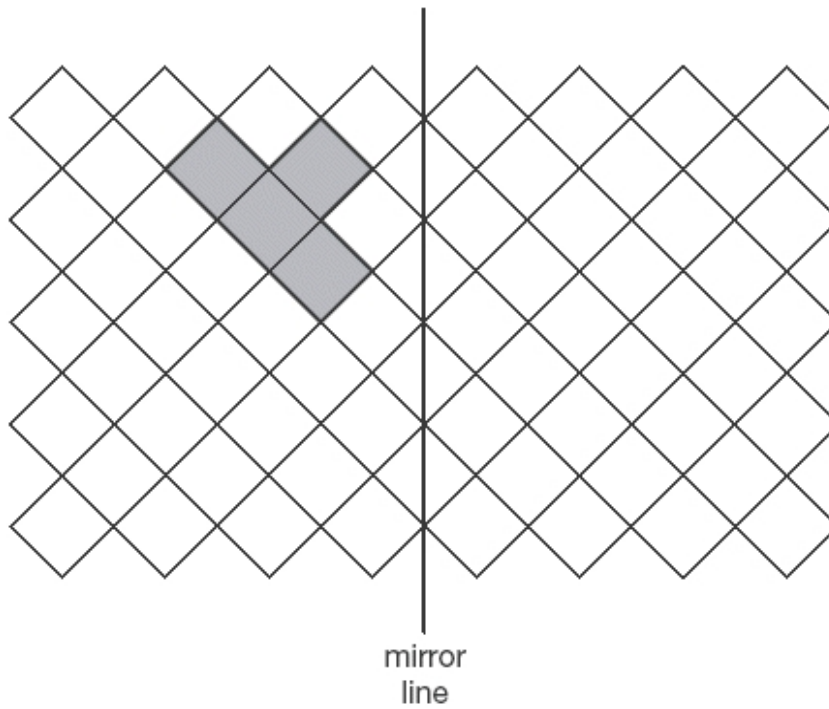
1

**Reflections**

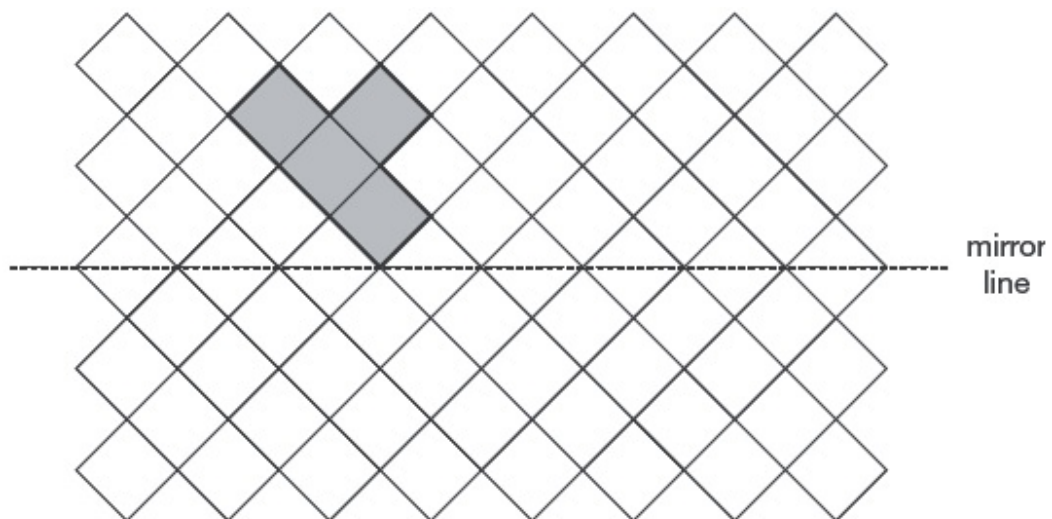
The shaded shapes in this question are drawn on square grids.

The mirror lines are shown.

Draw the **reflection** of each shape.



1 mark



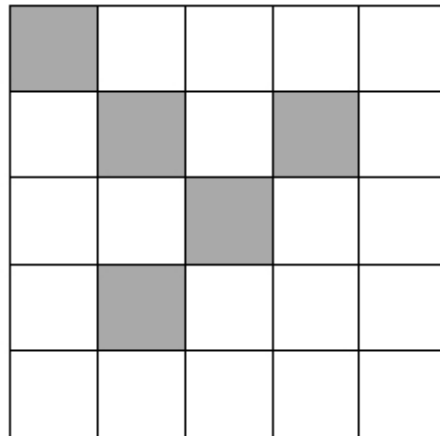
1 mark

2

## Five squares

- (a) This diagram has **one line of symmetry**.

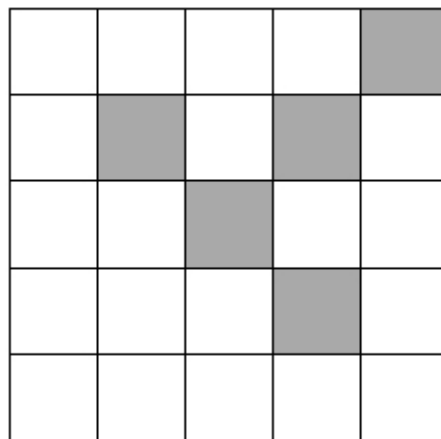
Draw the line of symmetry on the diagram below.



Square  
grid

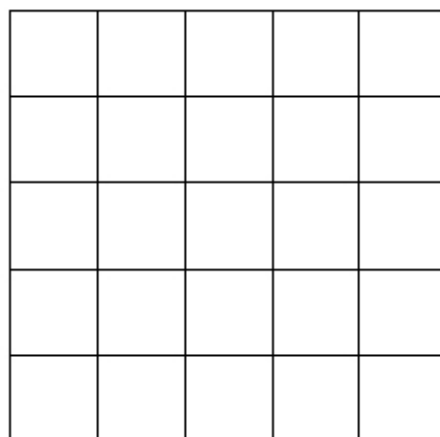
1 mark

- (b) Here is the same diagram after a **quarter-turn clockwise**.



Square  
grid

Complete the diagram below to show it after **another quarter-turn clockwise**.



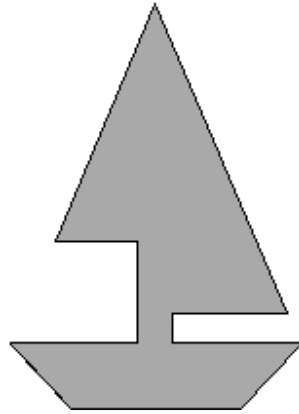
Square  
grid

1 mark

**3****Card shape**

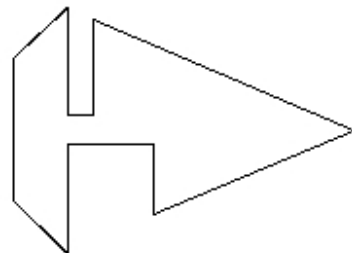
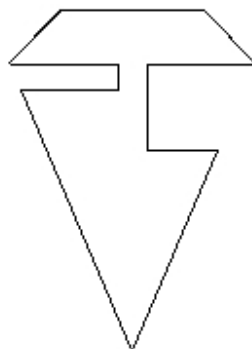
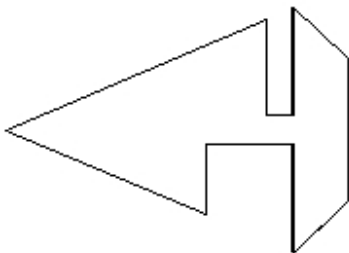
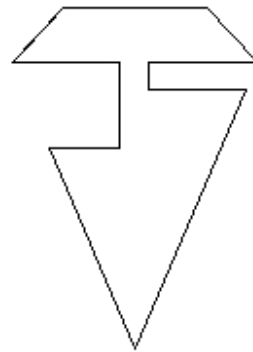
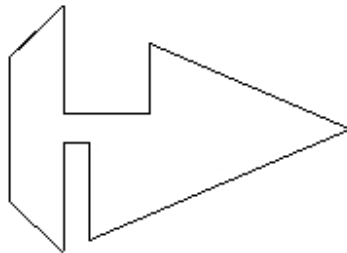
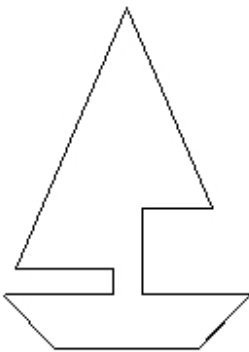
Samir has a piece of card that is grey on one side and white on the other.

He cuts out this shape from the card.



He turns over the shape so that the white side is showing.

Tick (✓) **all** the shapes below that show the **white** side of Samir's shape.



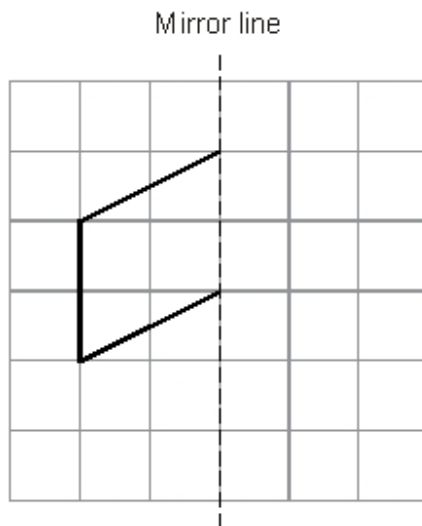
2 marks

4

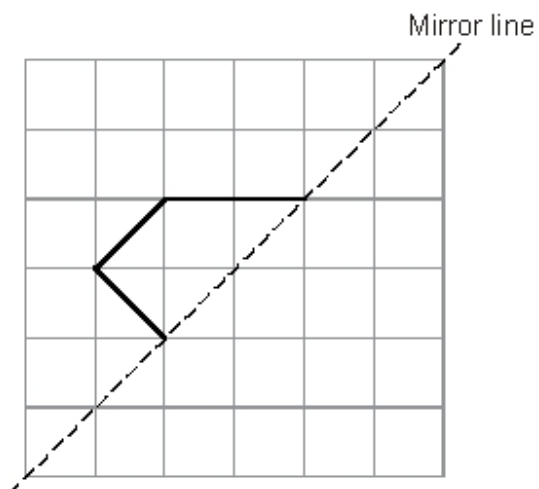
**Reflecting**

The diagrams in this question are drawn on square grids.

Reflect the shapes in the mirror lines.



1 mark

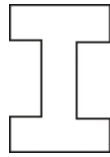


1 mark

5

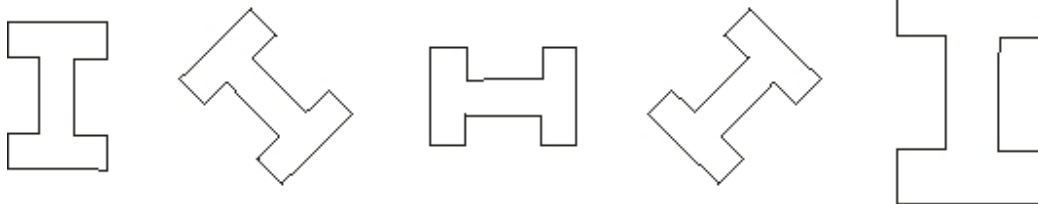
**Turning**

Here is a shape.



I turn the shape through **45° clockwise**.

Tick (✓) the diagram that shows the shape **after** the turn.

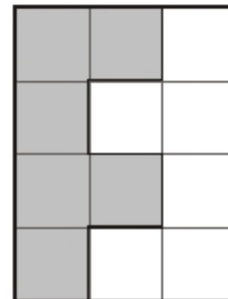


1 mark

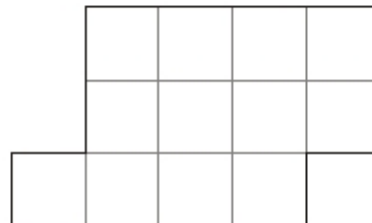
6

**Fitting tiles**

- (a) The diagram shows how two congruent 'F-tiles' fit together to make a rectangle.



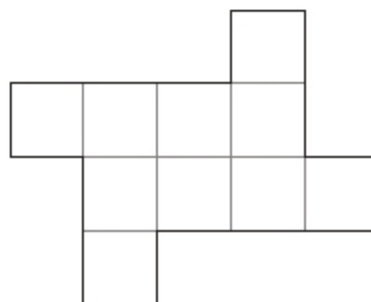
Show how the two congruent 'F-tiles' can fit together to make this shape.



1 mark

- (b) Two other tiles fit together to make a different shape.

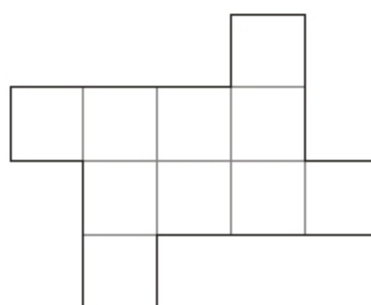
The two tiles are congruent but they are **not 'F-tiles'** .



What shape could the tiles be?  
Show them on the diagram.

1 mark

What **other** shape could the tiles be?  
Show them on the diagram.

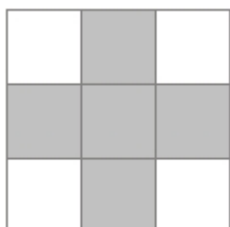


1 mark

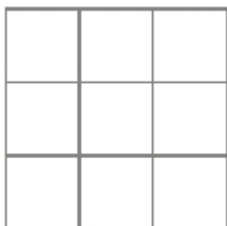
7

### Grid patterns

On the square grid below, some squares are shaded to make a pattern with exactly **4 lines** of symmetry.

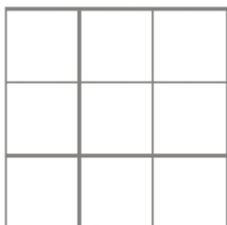


- (a) On the square grid below, shade some squares to make a pattern with exactly **2 lines** of symmetry.



1 mark

- (b) On the square grid below, shade some squares to make a pattern with exactly **1 line** of symmetry.



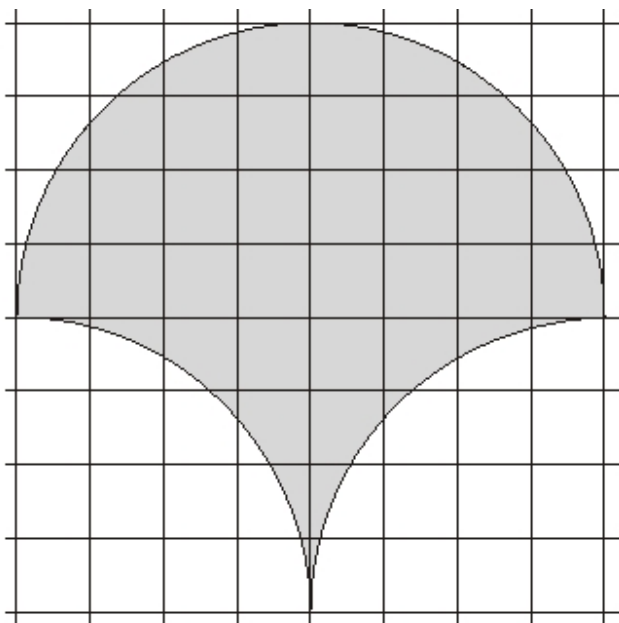
1 mark

8

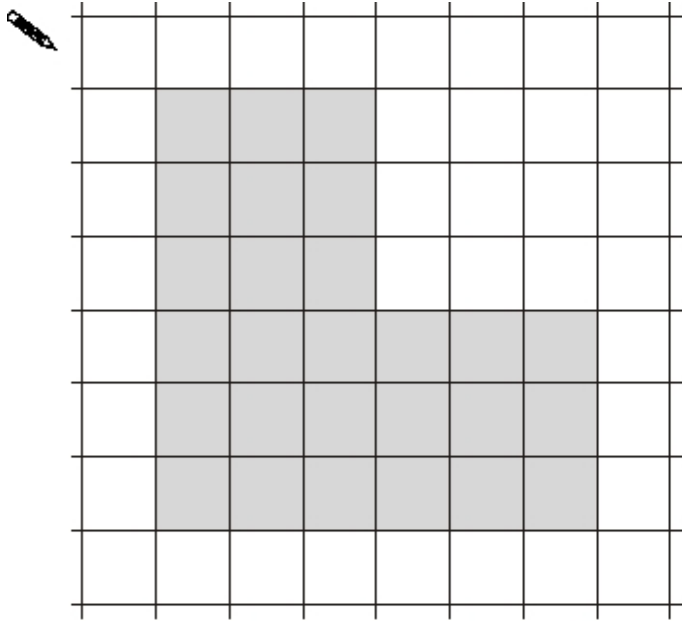
### Line symmetry

The shapes below are drawn on square grids. Each shape has **one line of symmetry**.

Draw the line of symmetry on each shape.



1 mark

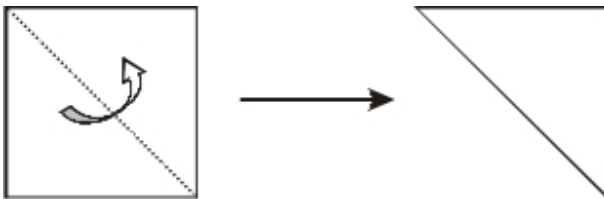


1 mark

9

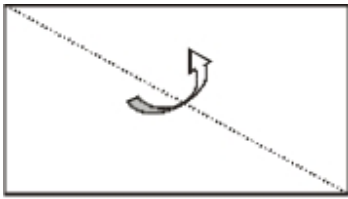
### Folding shapes

When you fold a **square** along a diagonal, you see a triangle.



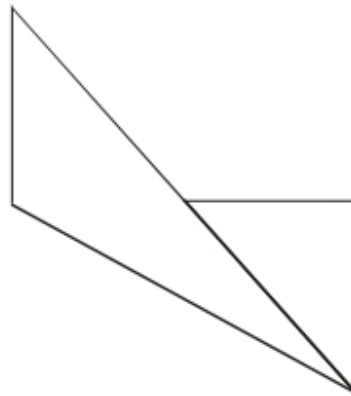
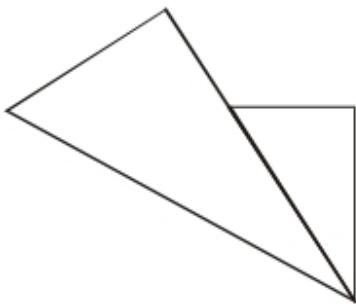
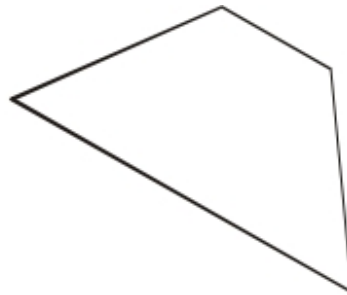
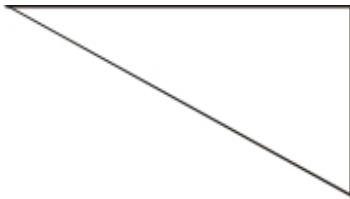


- (a) What do you see when you fold a **rectangle** along a diagonal?



Ring the correct answer below.

*Incorrect* →

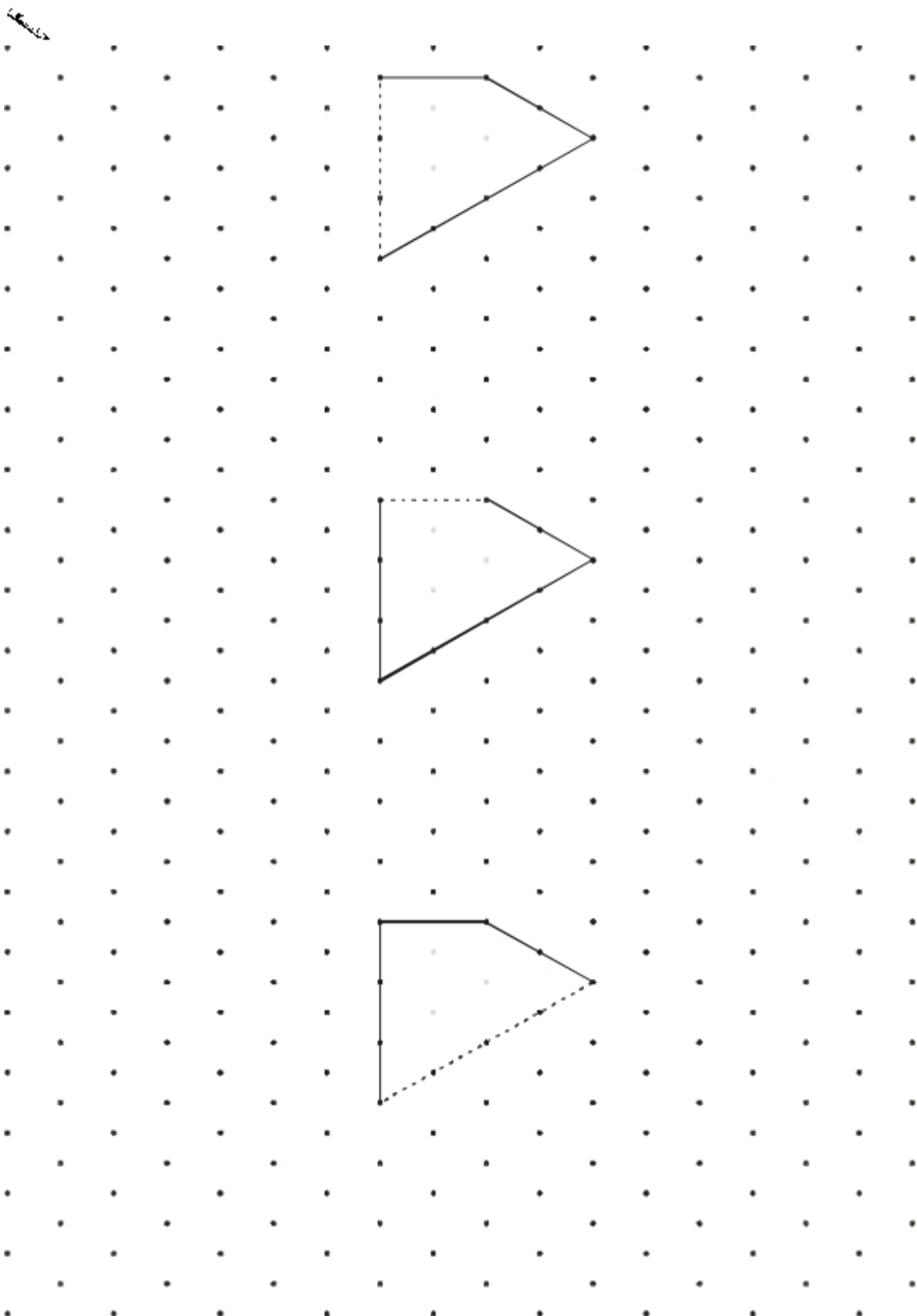


1 mark

- (b) Three different shapes are folded along a line of symmetry.

For each shape, the **dashed line** is the **fold line**.

For each shape, draw what the shape looked like **before** it was folded.

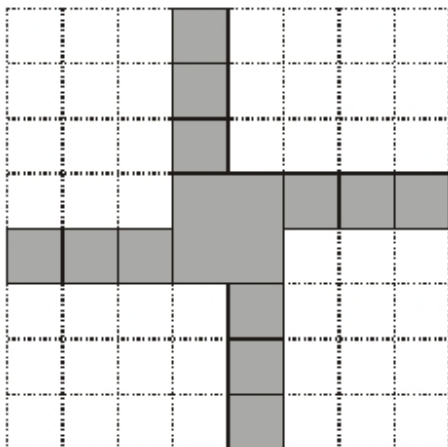


10

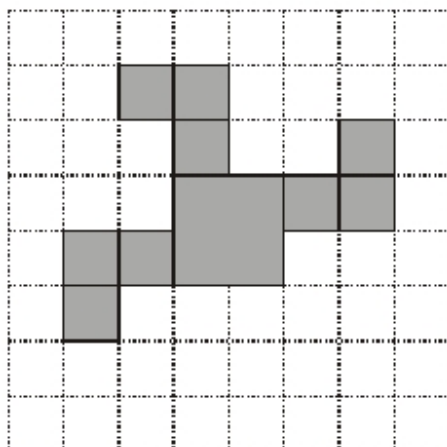
**Windmills**

'Windmill' patterns look the **same** when you **turn** the grid through one or more right angles.

Example:

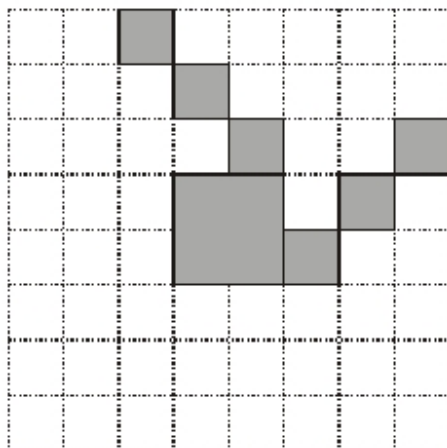


- (a) **Shade 3 squares** to complete the windmill pattern on the square grid below.



1 mark

- (b) **Shade 6 squares** to complete the windmill pattern on the square grid below.



1 mark

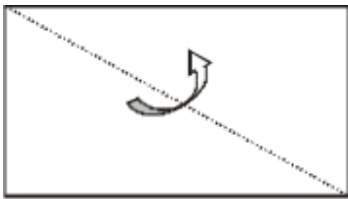
11

## Folding shapes

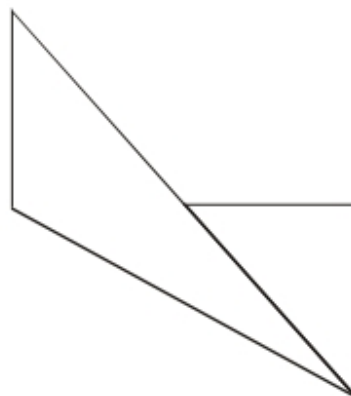
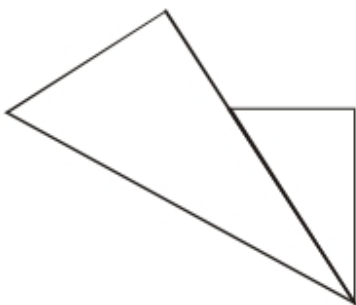
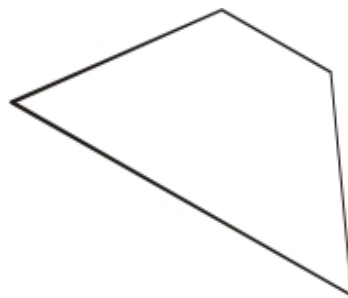
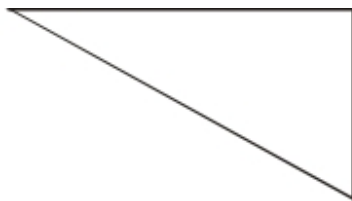
When you fold a **square** along a diagonal, you see a triangle.



- (a) What do you see when you fold a **rectangle** along a diagonal?



Ring the correct answer below.

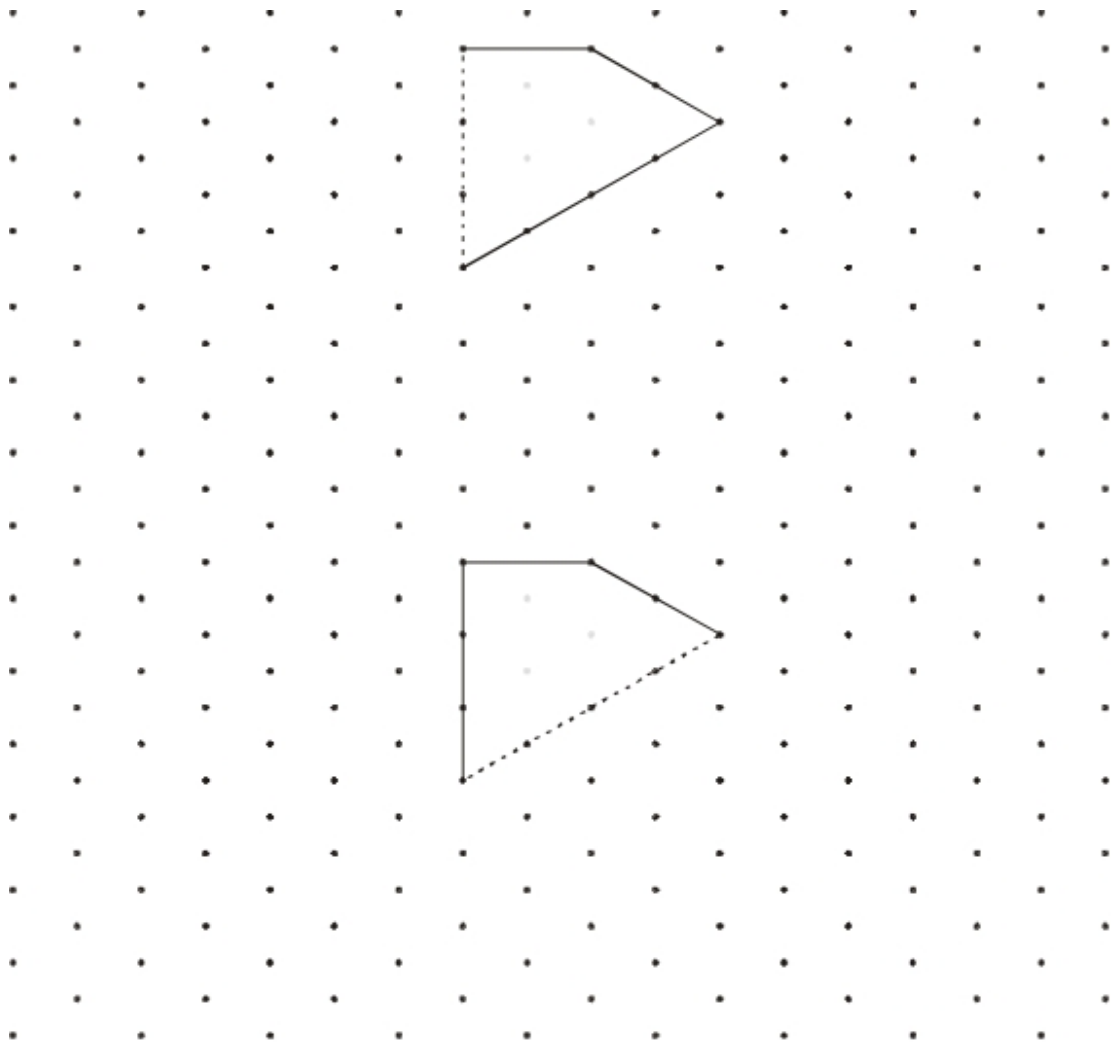


1 mark

- (b) Two different shapes are folded along a line of symmetry.

For each shape, the **dashed line** is the **fold line**.

For each shape, draw what the shape looked like **before** it was folded.



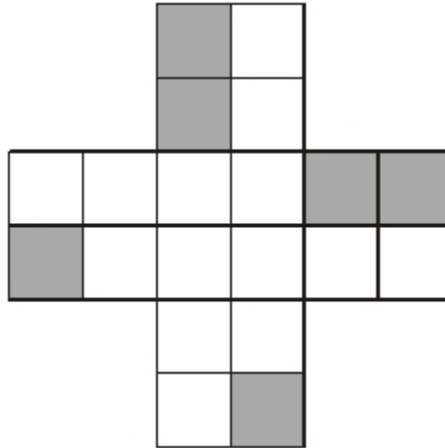
Isometric grid

2 marks

12

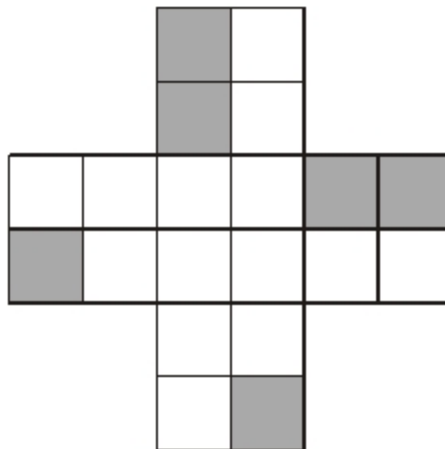
## Symmetry patterns

- (a) Shade **two** more squares on the shape below so that it has **rotation symmetry** of order 4



1 mark

- (b) Now shade **four** more squares on the shape below so that it has **rotation symmetry** of order 2



1 mark

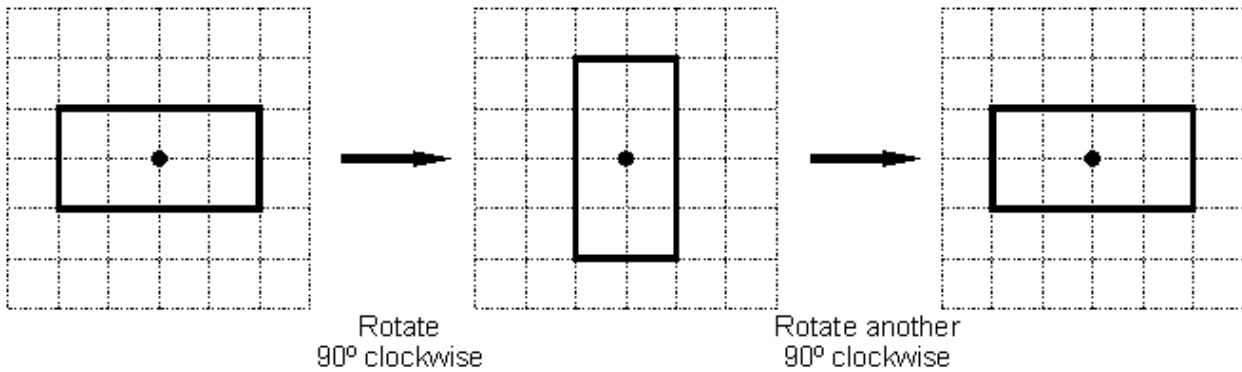
13

## Rotating

The shapes below are drawn on square grids.

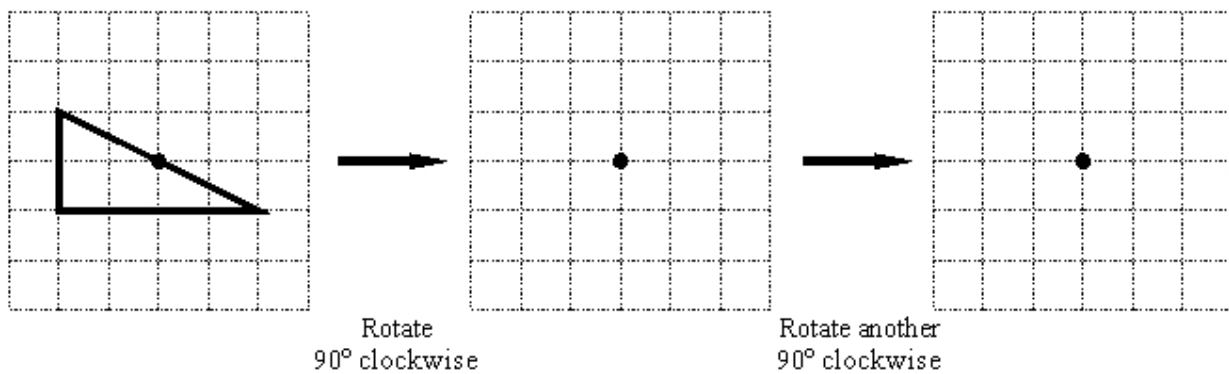
The diagrams show a rectangle that is rotated, then rotated again.

The centre of rotation is marked ●



Complete the diagrams below to show the triangle when it is rotated, then rotated again.

The centre of rotation is marked ●

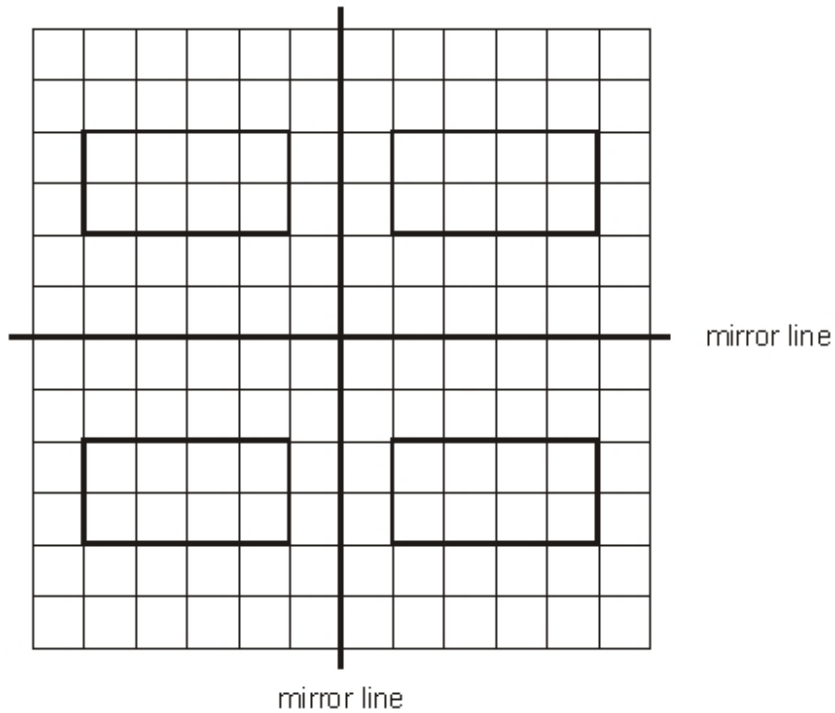


2 marks

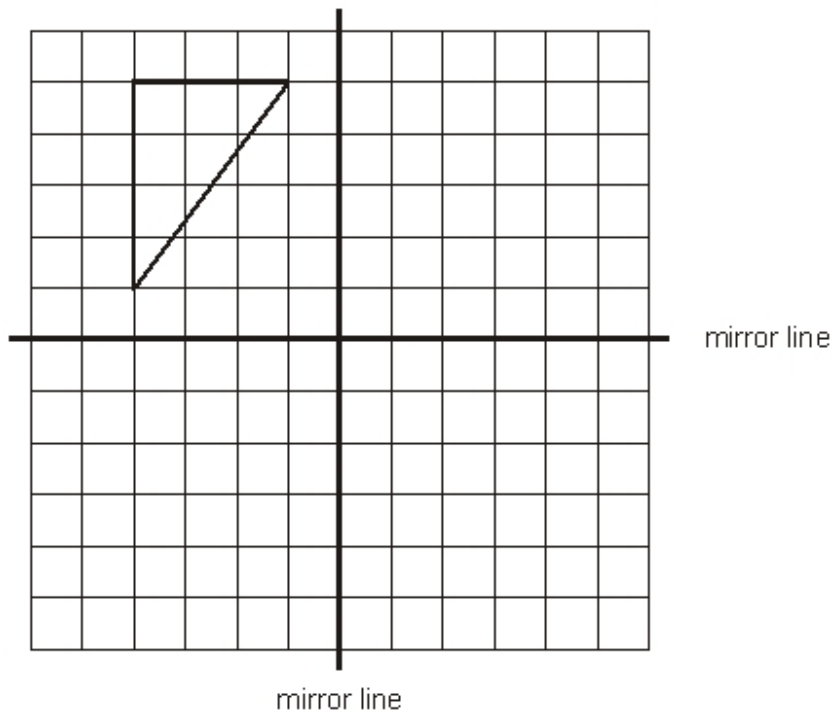
14

**Mirror lines**

The square grid shows a rectangle reflected in **two mirror lines**.



On the square grid below, show the **triangle** reflected in the two mirror lines.



2 marks

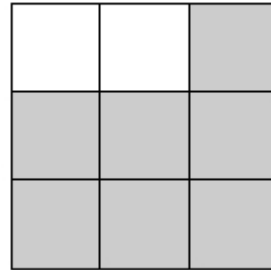


15

**Square grid**

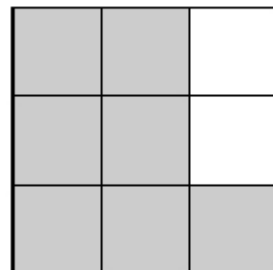
Part of a square grid is shaded.

- (a) **What fraction** of the grid is shaded?

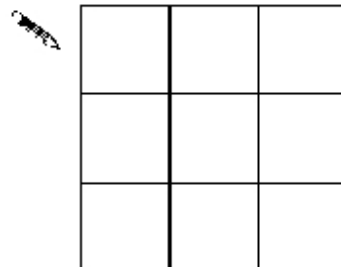


1 mark

The diagram shows the same grid after a **quarter turn clockwise**.



- (b) Shade this diagram to show the grid after **another** quarter turn clockwise.

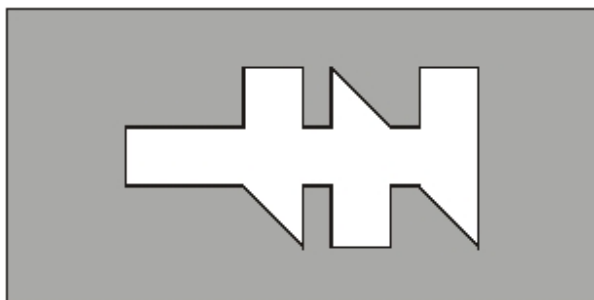


1 mark

16

**Which shape?**

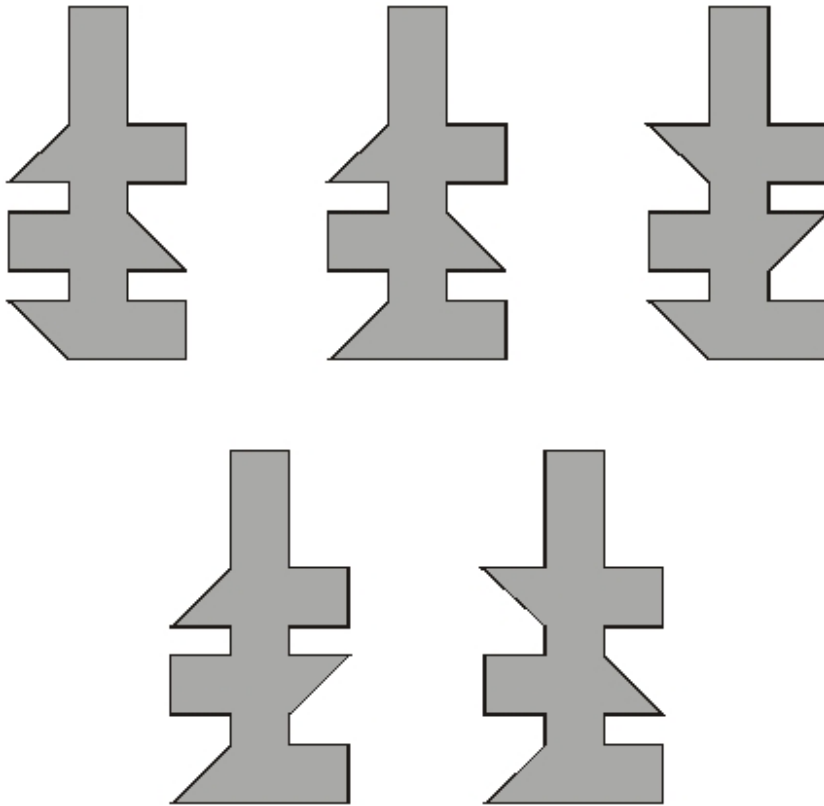
A shape is cut out of a piece of card, leaving a hole.



Which shape below will fit the hole exactly?

Put a ring round the correct shape.

1. 100%

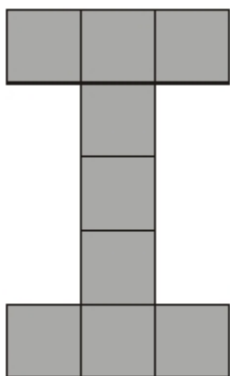


1 mark

17

### Turning

All the shapes in this question are made from nine squares.  
This shape will look the **same** when it is **turned** through **two right angles**.

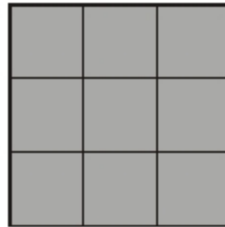


Which shapes below will look the same when they are turned through two right angles?

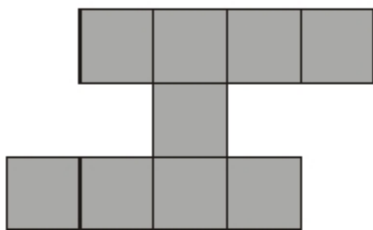
Tick (✓) the ones that do. Cross (x) the ones that do not.



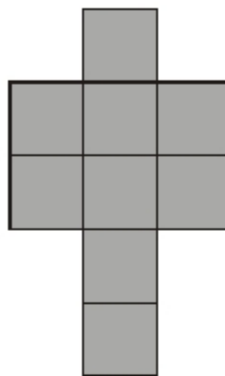
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.....



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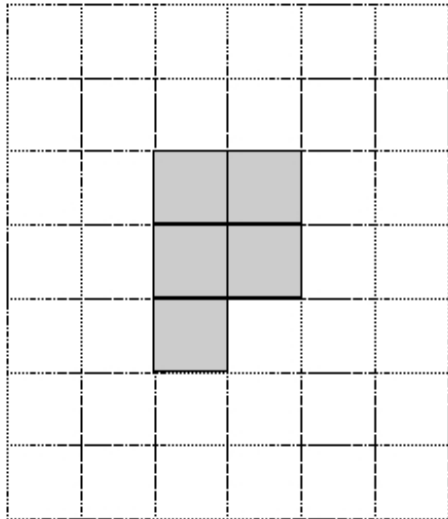
2 marks

**18****Five tiles**

Look at the square grid.

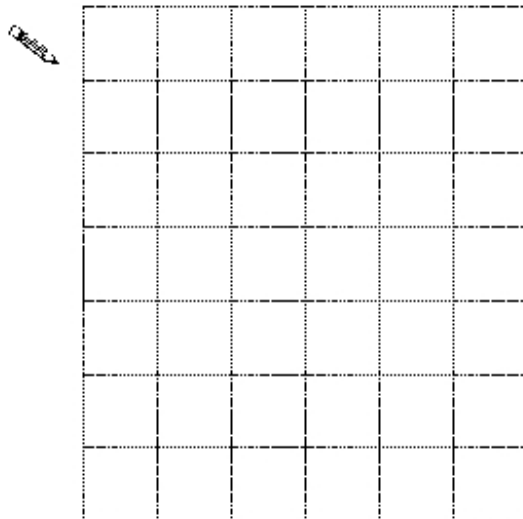
**Five squares** are shaded to make a shape.

The shape has **no** lines of symmetry.



On the grid below, **shade five squares** to make a different shape.

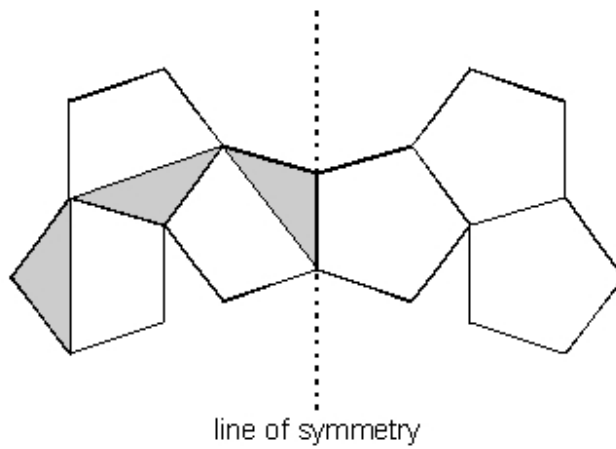
The shape must have exactly **one line of symmetry**.

**1 mark**

19

**Mirror line**

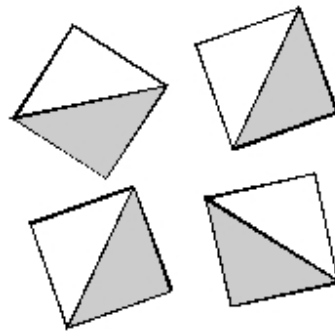
Draw in and shade **3 triangles** so that the dashed line is a line of symmetry (a mirror line).

**2 marks**

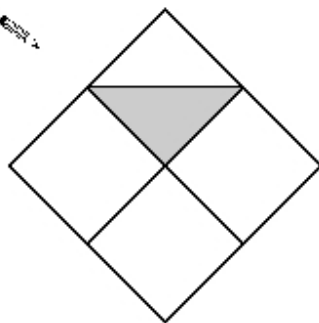
20

**Making patterns**

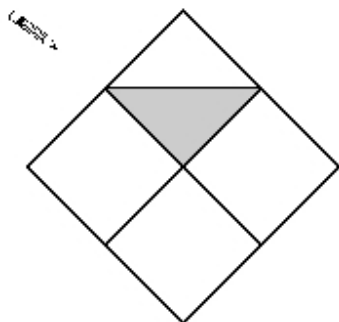
I have four identical square tiles.



- (a) Show how the four tiles can fit together to make a pattern with **4 lines of symmetry**.

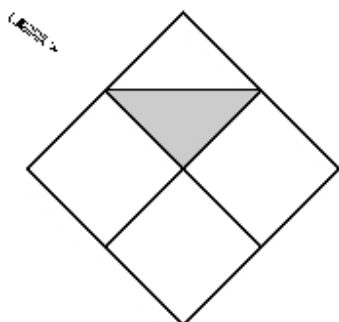
**1 mark**

- (b) Now show how the four tiles can fit together to make a pattern with **no lines of symmetry**.



1 mark

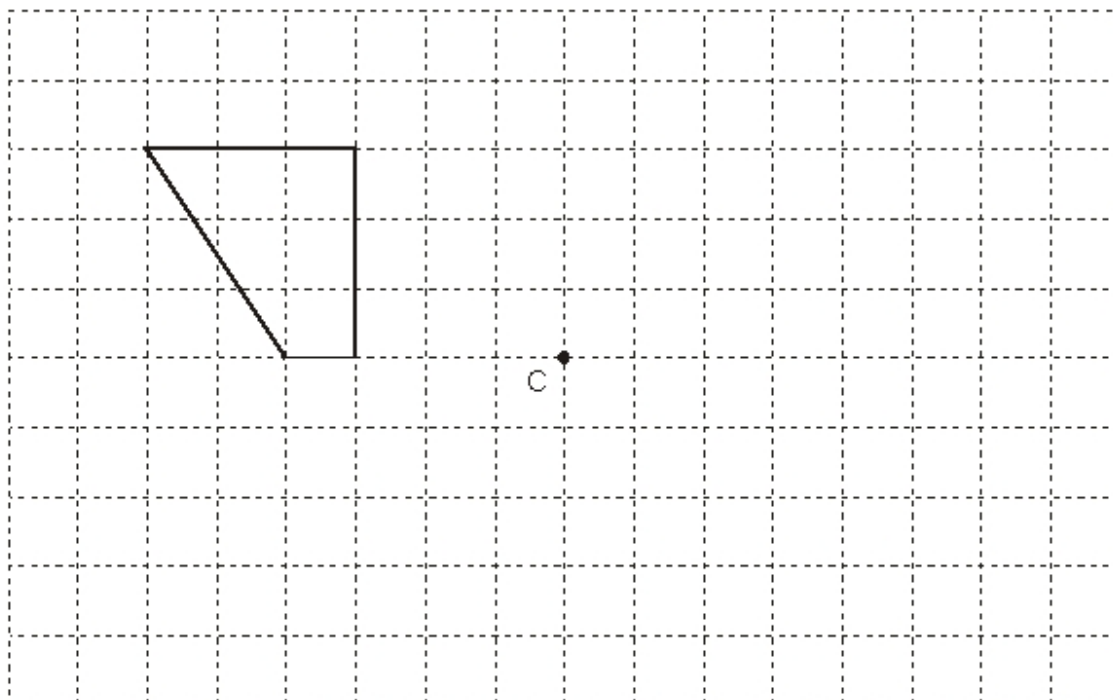
- (c) Show how the four tiles can fit together to make a pattern with **rotation symmetry of order 2**



1 mark

**21****Rotating**

Look at the shape drawn on the square grid.



On the grid, draw a **180° rotation** of the shape, using **point C** as the **centre** of rotation.

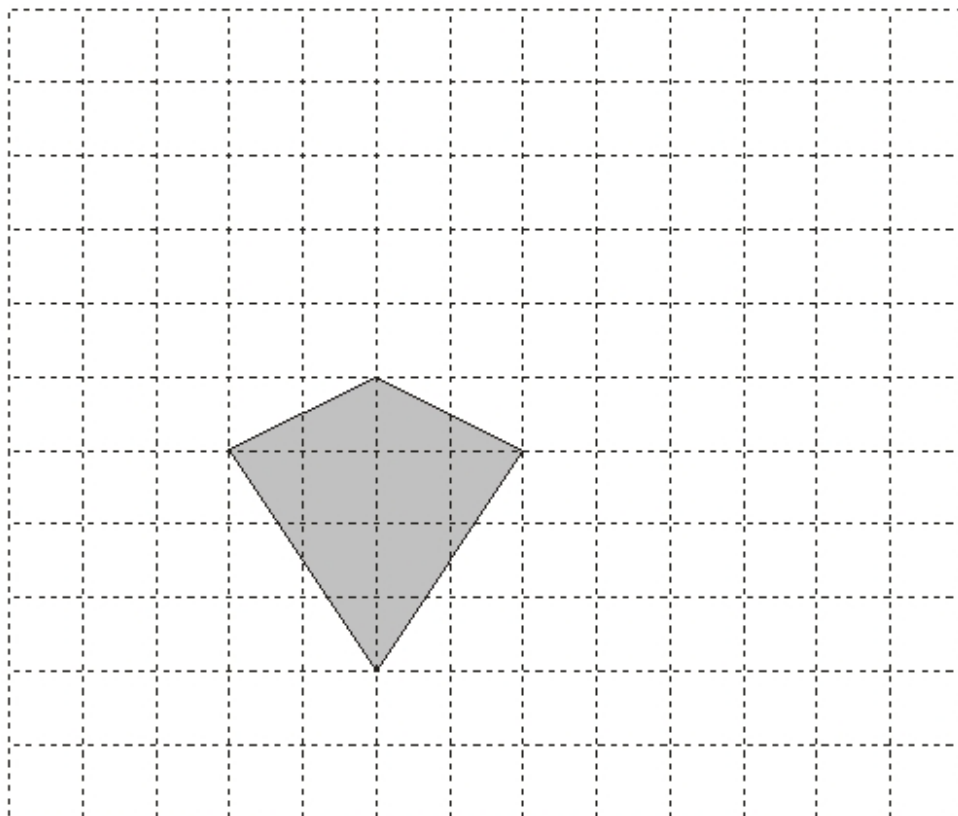
2 marks

22

## Tessellation

The diagram shows a kite drawn on a square grid.

Draw **five more** of these kites to show how they tessellate.



2 marks



23

Here are some signs.



*A*



*B*



*C*



*D*



*E*



*F*



*G*



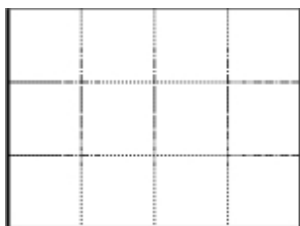
*H*

Complete the table to show the symmetry of the signs.

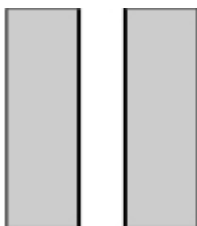
	Line Symmetry	Rotational Symmetry
<i>A</i>	✓	✓
<i>B</i>	X	✓
<i>C</i>		
<i>D</i>		
<i>E</i>		
<i>F</i>		
<i>G</i>		
<i>H</i>		

**24****Patterns**

I have a square grid and two rectangles.

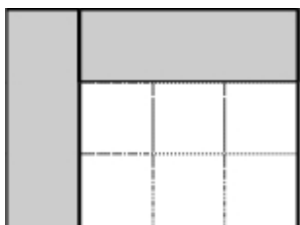


grid



two rectangles

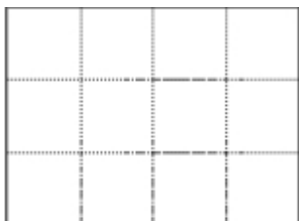
I make a pattern with the grid and the two rectangles:



The pattern has **no** lines of symmetry.

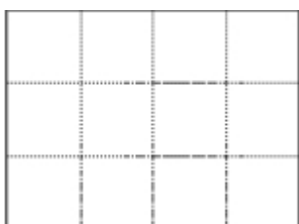
- (a) Put both rectangles on the grid to make a pattern with **only one** line of symmetry.

You must **shade** the rectangles.

**1 mark**

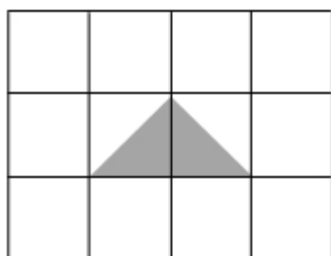
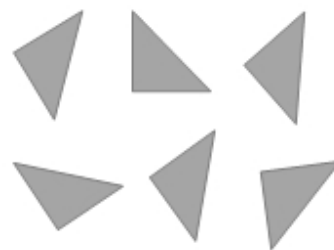
- (b) Put both rectangles on the grid to make a pattern with **rotation** symmetry of **order 2**

You must **shade** the rectangles.

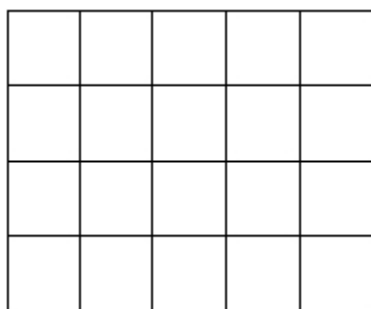
**1 mark**

25

Here are some right-angled triangular tiles.  
They are all the same shape and size.  
Two tiles fit together to make a bigger triangle.

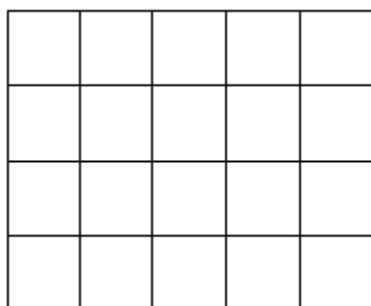


- (a) Show how **four** of the tiles can fit together to make a **rectangle**.



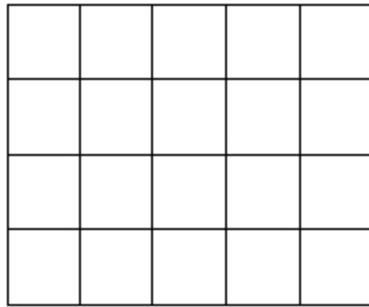
1 mark

- (b) Show how **eight** of the tiles can fit together to make a **square**.



1 mark

- (c) Show how **four** of the tiles can fit together to make a **square**.

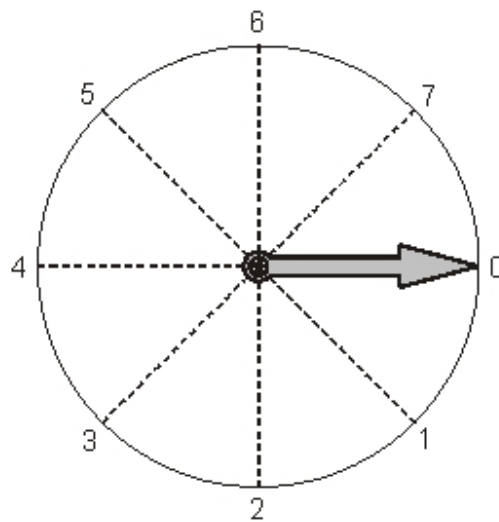


1 mark

26

### Dial

Look at the dial.



The pointer starts at 0 and turns **clockwise** around the centre.

- (a) Which number does it point to after turning clockwise through **90°**?



1 mark

- (b) The pointer turns clockwise from **3 to 6**

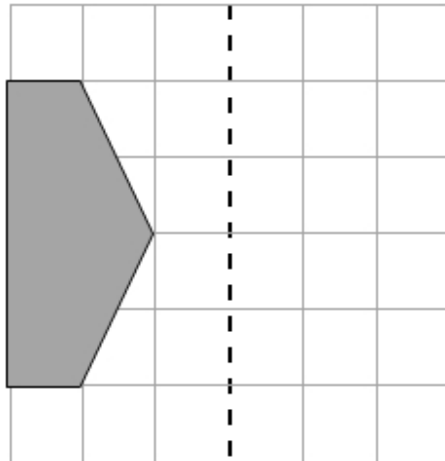
Through how many degrees does it turn?



1 mark

27

Reflect the shape in the mirror line.



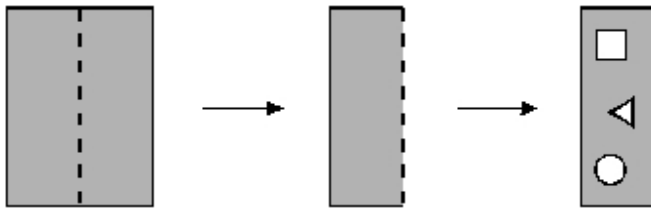
2 marks

28

### Folding and Cutting

(a) I start with a rectangle of paper.

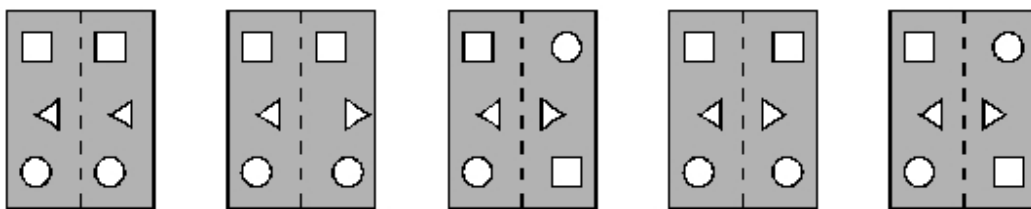
I fold it in half, then I cut out three shapes.



Then I unfold my paper.

Circle the diagram below that shows what my paper looks like now.

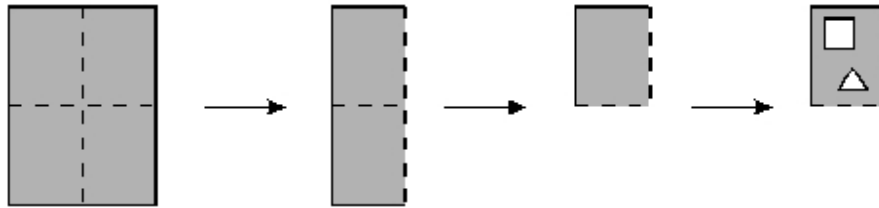
*Handwritten mark*



1 mark

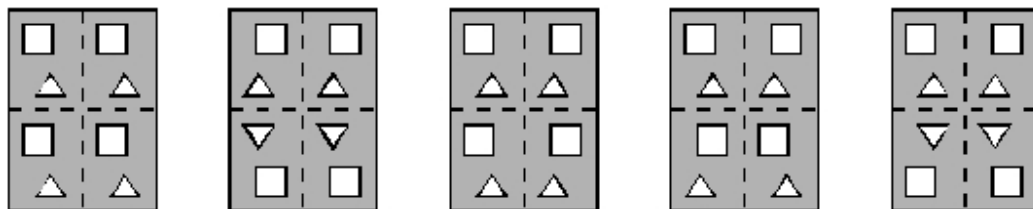
- (b) I start again with a different rectangle of paper.

I fold it in half, then in half again, then I cut out two shapes.



Then I unfold my paper.

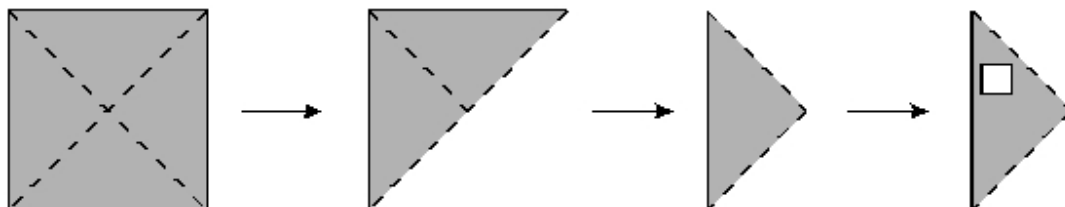
Circle the diagram below that shows what my paper looks like now.



1 mark

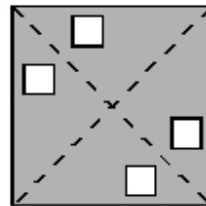
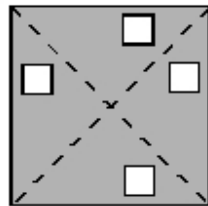
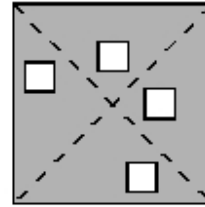
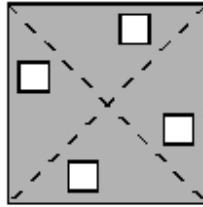
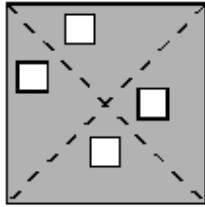
- (c) I start with a square of paper.

I fold it in half, then in half again, then I cut out one shape.



Then I unfold my paper.

Circle the diagram below that shows what my paper looks like now.



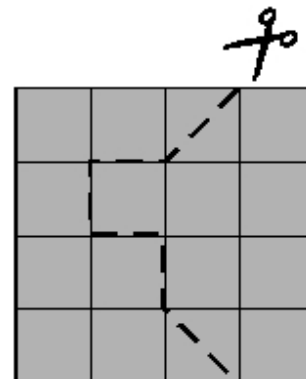
1 mark

29

### Pieces

(a) I have a square piece of card.

I cut along the dashed line to make two pieces of card.



Do the two pieces of card have the **same area**? Tick (✓) Yes or No.



Yes

☐

No

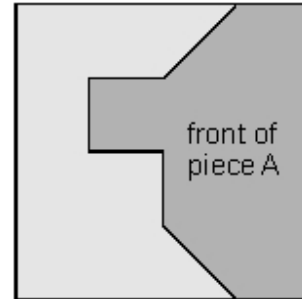
☐

Explain your answer.



1 mark

- (b) The card is shaded **grey** on the front, and **black** on the back.
- I turn piece A over to see its black side.
- Which of the shapes below shows the black side of piece A?



Put a tick (✓) under the correct answer.



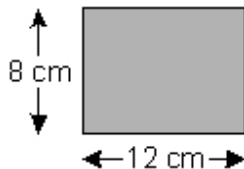
1 mark

30

### Folding

- (a) I have a rectangle made out of paper.

The rectangle measures 12cm by 8cm.



I want to **fold** the rectangle in **half** to make a smaller rectangle.

I can do this in two different ways.

What size could the smaller rectangle be? Write both ways.



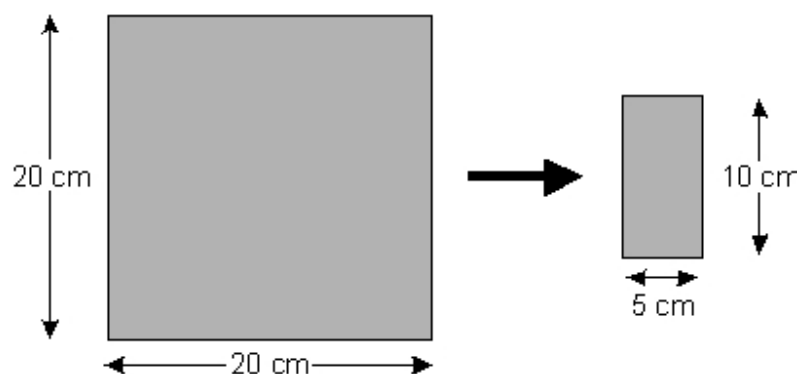
first way: ..... cm by ..... cm  
second way: ..... cm by ..... cm

2 marks



(b) I have a square made out of paper. The square measures 20cm by 20cm.

I keep folding it in half until I have a rectangle that is 5cm by 10cm.



How many times did I fold it?

.....

1 mark

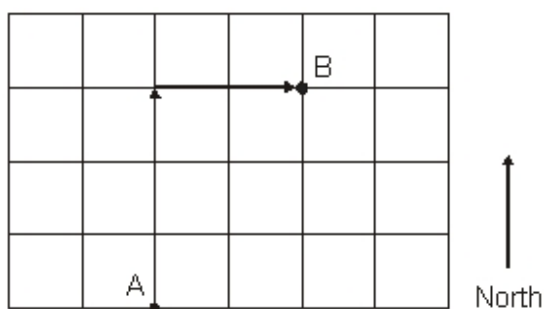
31

### Moving on a grid

To move **from A to B** on the square grid:

move North 3

then East 2

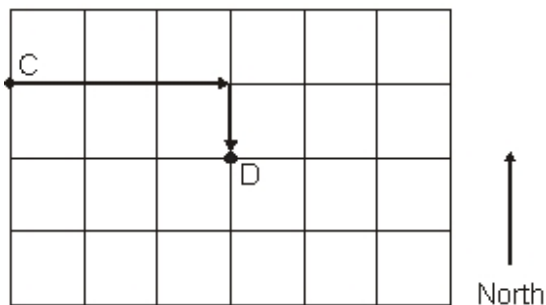


- (a) Write the missing direction.

To move **from C to D** on the square grid:

move East 3

 then \_\_\_\_\_




1 mark

- (b) Write the missing directions.

To move around the four sides of a square on the square grid:

move West 1

 then \_\_\_\_\_

then \_\_\_\_\_

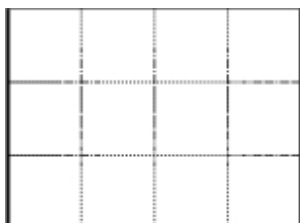
then \_\_\_\_\_

1 mark

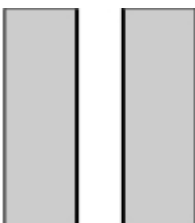
**32**

## Patterns

I have a square grid and two rectangles.

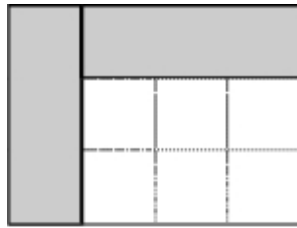


grid



two rectangles

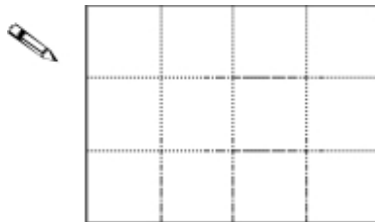
I make a pattern with the grid and the two rectangles:



The pattern has **no** lines of symmetry.

- (a) Put both rectangles on the grid to make a pattern with **two** lines of symmetry.

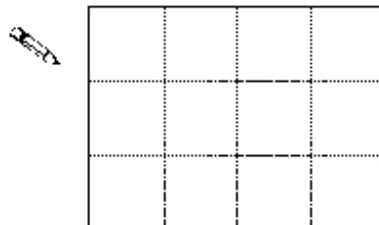
You must **shade** the rectangles.



1 mark

- (b) Put both rectangles on the grid to make a pattern with **only one** line of symmetry.

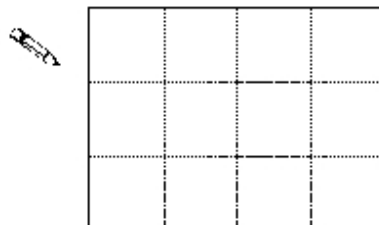
You must **shade** the rectangles.



1 mark

- (c) Put both rectangles on the grid to make a pattern with **rotation** symmetry of **order 2**

You must **shade** the rectangles.

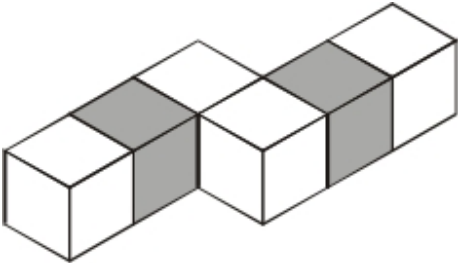


1 mark

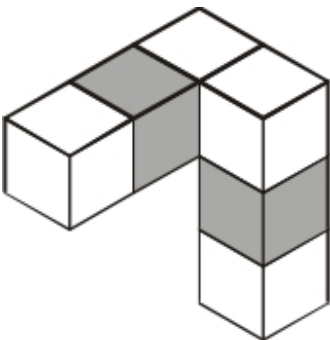
33

Shape rotation

Look at this shape made from six cubes.  
 Four cubes are white  
 Two cubes are grey.



Part of the shape is rotated through  $90^\circ$  to make the shape below.



After another rotation of  $90^\circ$ , the shape is a cuboid.

Draw this cuboid on the grid below.

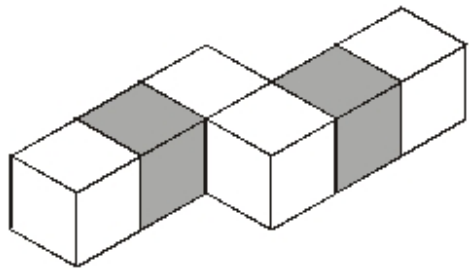


Isometric grid

2 marks

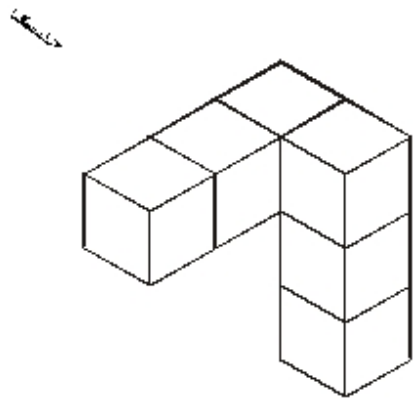
# 34 Shape rotation

Look at this shape made from six cubes.  
 Four cubes are white  
 Two cubes are grey.



(a) Part of the shape is rotated through  $90^\circ$  to make the shape below.

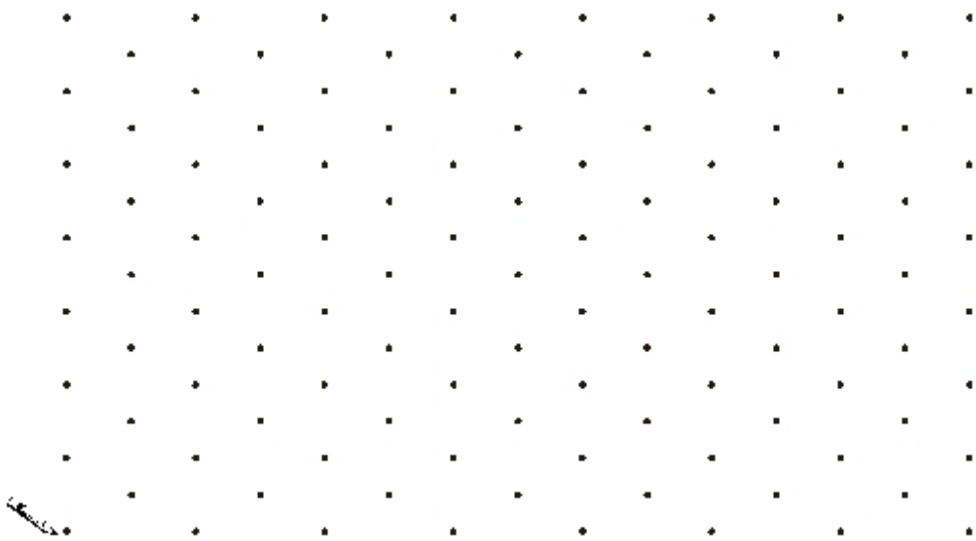
Shade the faces that are grey.



1 mark

(b) After another rotation of  $90^\circ$ , the shape is a cuboid.

Draw this cuboid on the grid below.



Isometric grid

2 marks

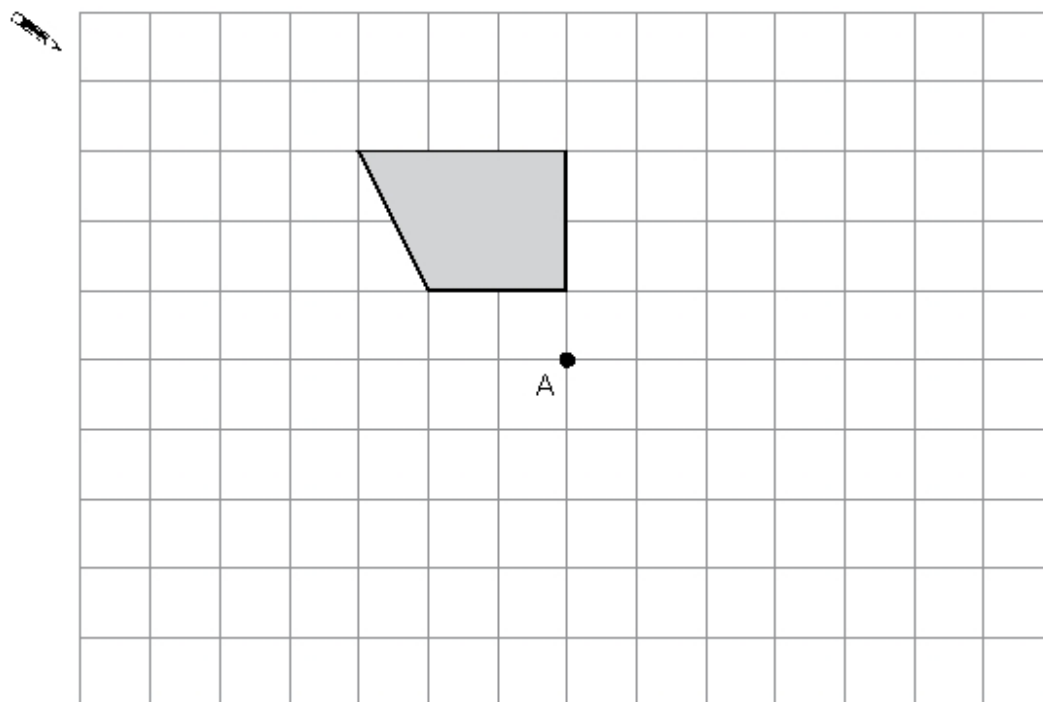
35

### Rotate 180

Here is a shaded shape drawn on a square grid.

Rotate the shape **180°** about point A.

Draw the shape in its new position on the grid.



2 marks