Perimeter and Area-Questions

1.

11. Look at the hexagon and the triangle.

Isometric grid

(a) Do the hexagon and triangle have the **same area**?

Tick (✓) Yes or No.

☐ Yes   ☐ No

Explain your answer.

1 mark

(b) Do the hexagon and triangle have the **same perimeter**?

Tick (✓) Yes or No.
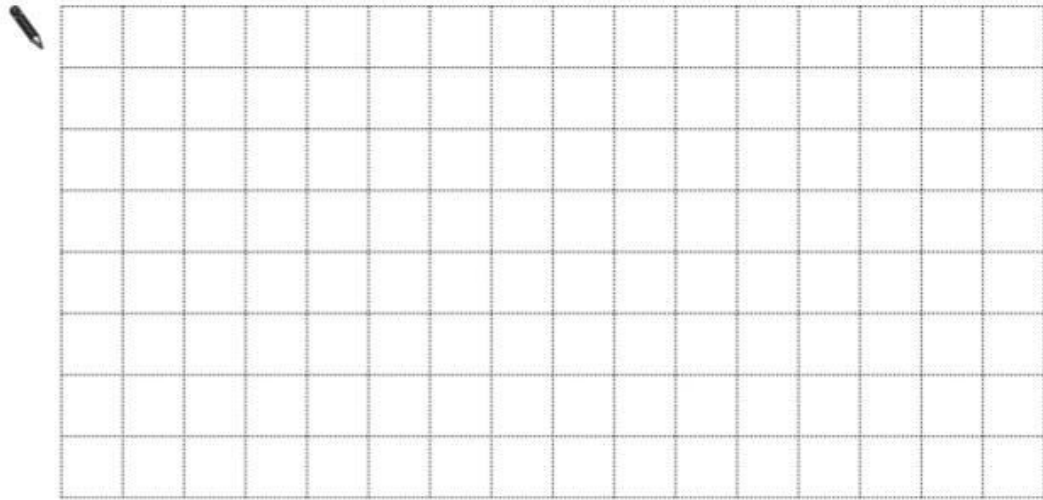
☐ Yes   ☐ No

Explain your answer.

1 mark

2.

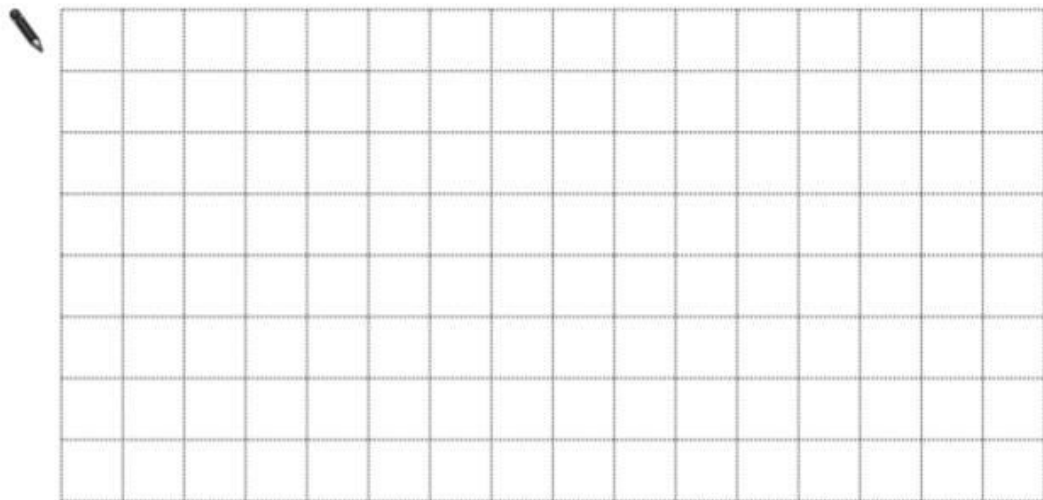**11.** In this question, all the grids are centimetre square grids.

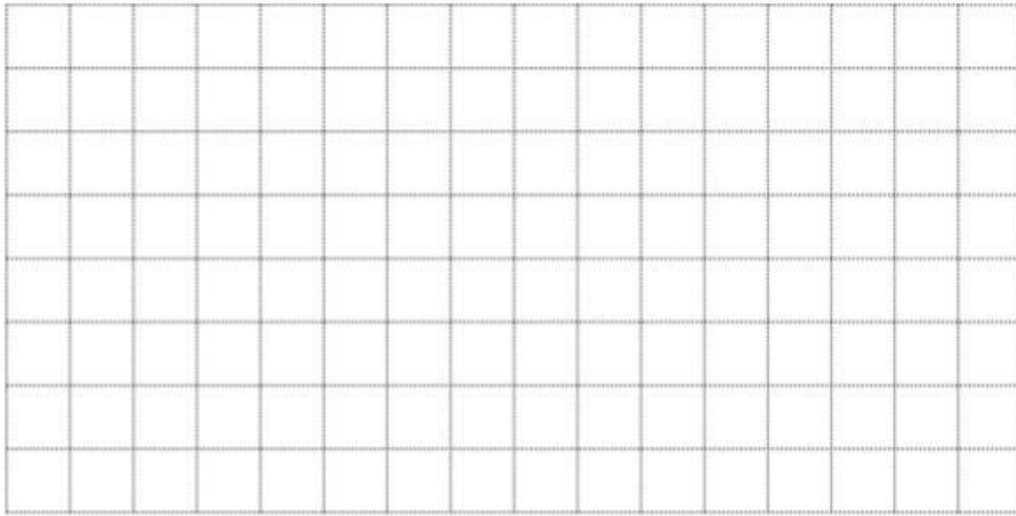(a) Draw a **rectangle** that has an **area** of **12 cm^2**

(b) Draw another rectangle that has an area of 12 cm^2

This rectangle must have a **different perimeter** from the rectangle in part (a).
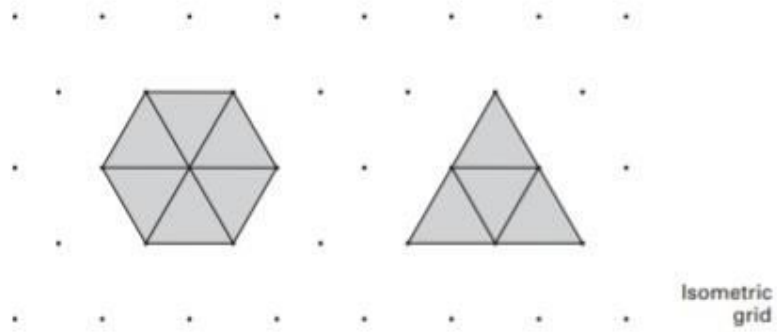
(c) Draw a **triangle** that has an **area** of **6cm²**

1 mark

Key Stage 3: 2003 Paper 1 Level 4-6

3.

6. Look at the hexagon and the triangle.

Isometric grid

(a) Do the hexagon and triangle have the **same area**?

Tick (✓) Yes or No.

☐ Yes   ☐ No

Explain your answer.

1 mark

(b) Do the hexagon and triangle have the **same perimeter**?

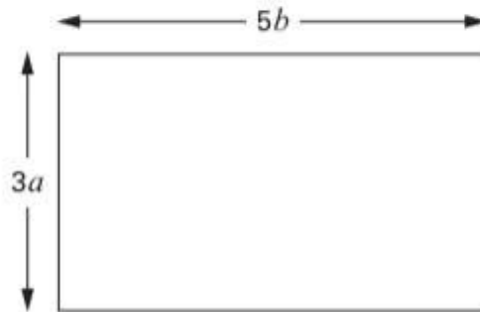Tick (✓) Yes or No.

☐ Yes   ☐ No

Explain your answer.

1 mark

4.

19. (a) The diagram shows a rectangle.

Its dimensions are $3a$ by $5b$

Write **simplified expressions** for the area and the perimeter of this rectangle.

Area: ....

Perimeter: ....

(b) A different rectangle has **area $12a^2$** and **perimeter $14a$**

What are the dimensions of this rectangle?

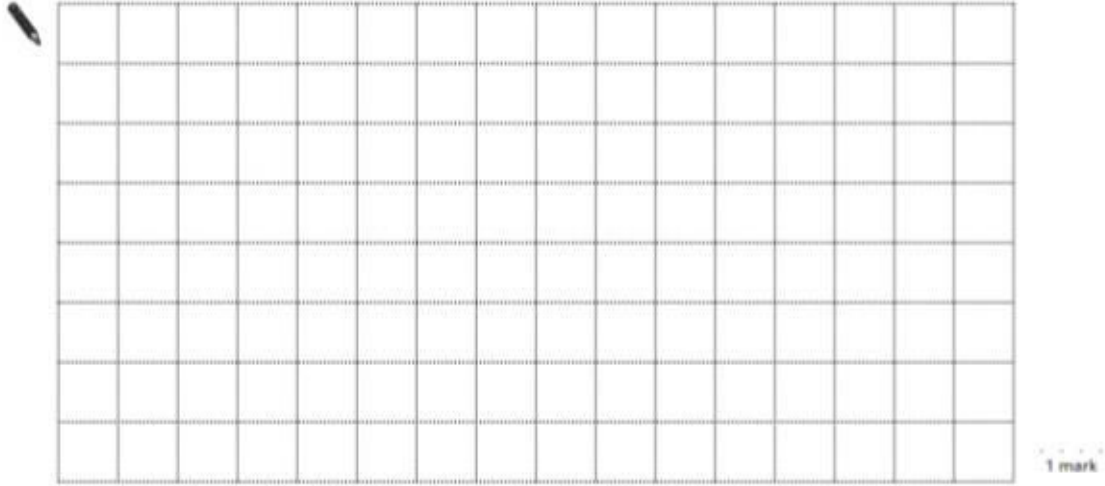Dimensions: .... by ....

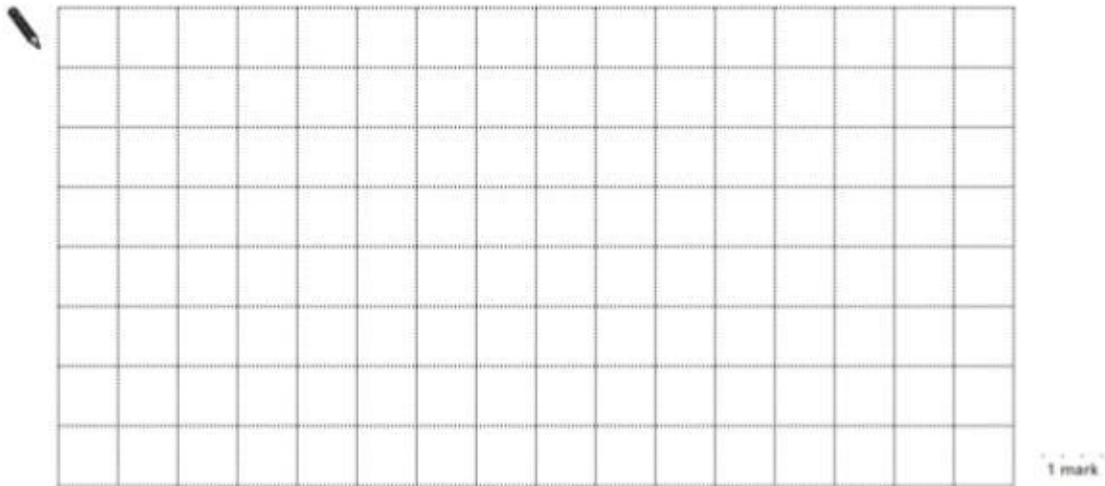Key Stage 3: 2003 Paper 2 Level 4-6

5.

6.   In this question, all the grids are centimetre square grids.

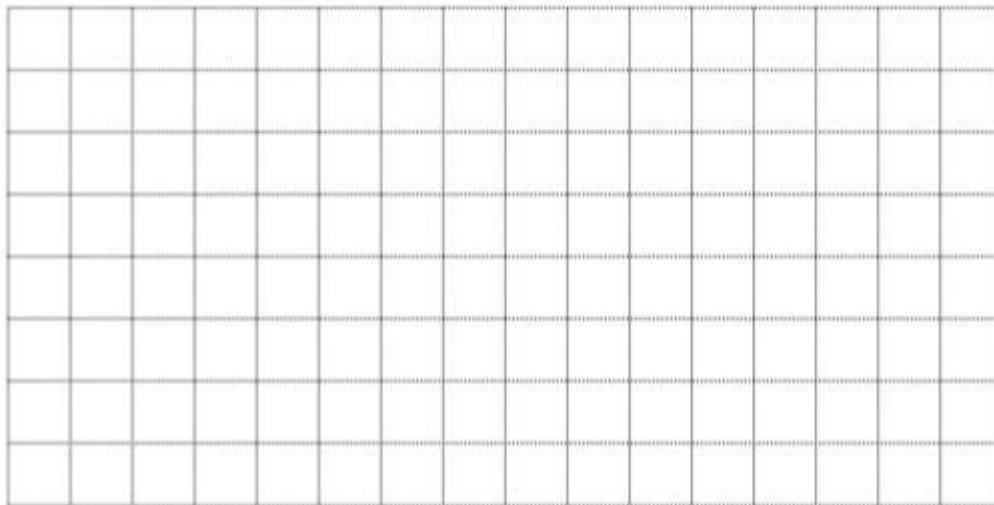(a) Draw a **rectangle** that has an **area** of **12 cm²**

(b) Draw another rectangle that has an area of 12 cm²

This rectangle must have a **different perimeter** from the rectangle in part (a).

(c) Draw a **triangle** that has an **area** of **6 cm^2**

6.

14. The information in the box describes three different squares, A, B and C.

The **area** of square A is **36 cm²**

The **side length** of square B is **36 cm**

The **perimeter** of square C is **36 cm**

Put squares A, B and C in order of size, starting with the smallest.

You **must** show calculations to explain how you work out your answer.

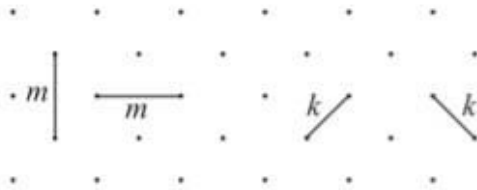............... ....

smallest   largest

7.

19. On the square grids below you can join dots with two different length lines.

Length m is greater than length k

Draw a shape with each perimeter shown below.

The first one is done for you.
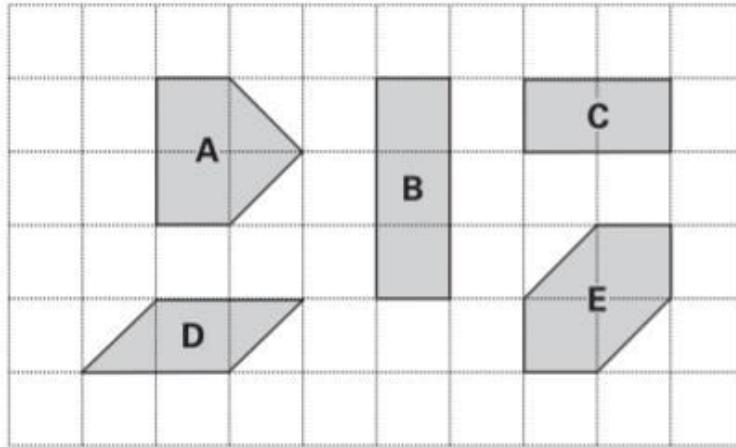
Perimeter $4k + 3m$

Perimeter $4k + m$

1 mark

Perimeter $2(2k + m)$

1 mark

Key Stage 3: 2004 Paper 1 Level 3-5

8.

11. The diagram shows some shapes on a 10 by 6 square grid.

(a) Which **two** shapes have the **same area** as shape **A**?

✎ ....

1 mark

(b) Which **two** shapes have the **same perimeter** as shape **A**?

✎ ....

1 mark

(c) How many of shape **C** would you need to cover a 10 by 6 square grid?
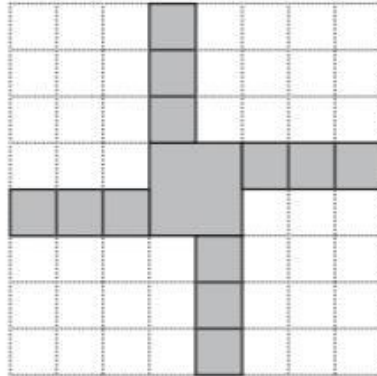
✎ ....

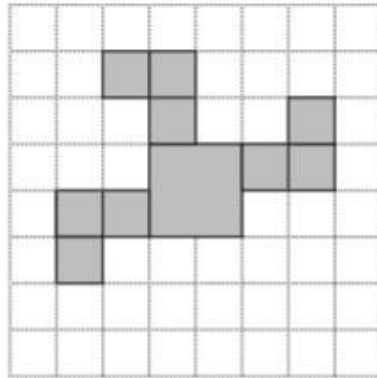1 mark

Key Stage 3: 2004 Paper 2 Level 3-5

9.

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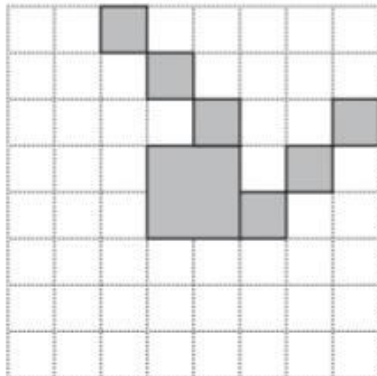
Example:

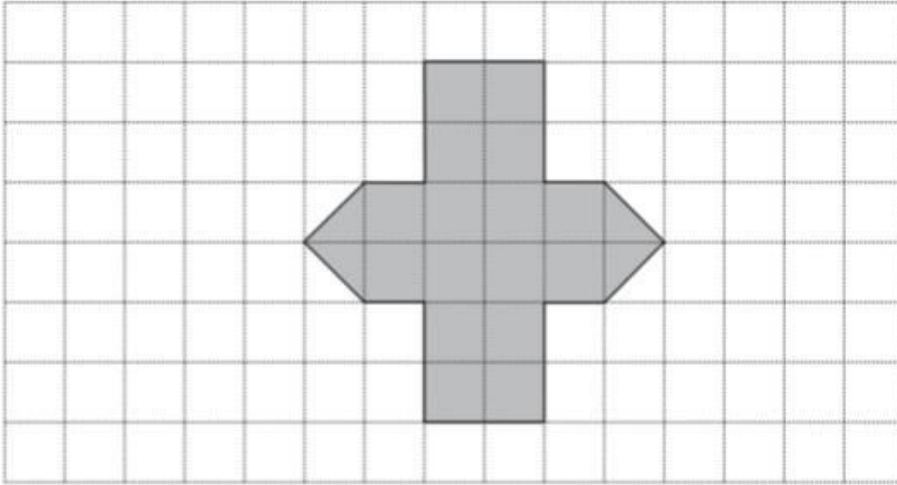(a) **Shade 3 squares** to complete the windmill pattern on the square grid below.

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

10.
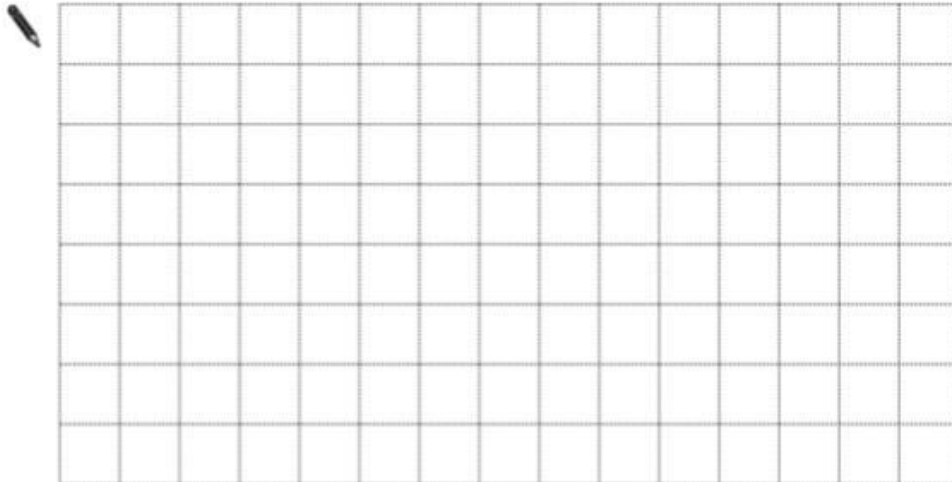
9. Here is a shaded shape on a centimetre square grid.

(a) What is the area of the shaded shape?

.... cm^2

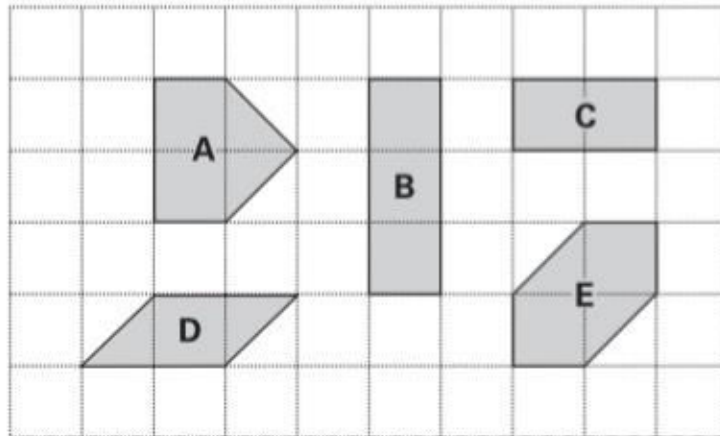(b) Now draw a **rectangle** that has the **same area** as the shaded shape.

Key Stage 3: 2004 Paper 1 Level 4-6

11.

6.   The diagram shows some shapes on a 10 by 6 square grid.

(a) Which **two** shapes have the **same area** as shape **A**?

![pencil icon]

....

(b) Which **two** shapes have the **same perimeter** as shape **A**?

![pencil icon]

....

(c) How many of shape **C** would you need to cover a 10 by 6 square grid?

![pencil icon]

....

12.

16. You can make only four different cuboids with **16 cubes.**

		Dimensions		
Cuboid **A**		1	1	16
Cuboid **B**		1	2	8
Cuboid **C**		1	4	4
Cuboid **D**		2	2	4

(a) Which of the cuboids **A** and **D** has the **larger surface area?**

Tick (✓) the correct answer below.

Cuboid A ☐

Cuboid D ☐

Both the same ☐

Explain how you know.

1 mark

(b) Which cuboid has the **largest volume?**

Tick (✓) the correct answer below.

Cuboid A ☐

Cuboid B ☐

Cuboid C ☐

Cuboid D ☐

All the same ☐

(c) How many of **cuboid D** make a cube of dimensions **4 x 4 x 4?**

....

(d) You can make only six **different** cuboids with **24 cubes.**

Complete the table to show the dimensions.
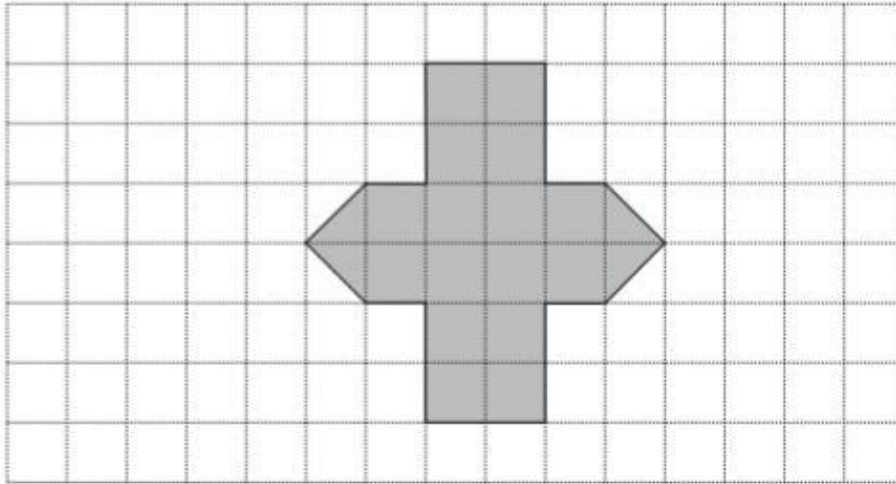
Two have been done for you.

	Dimensions		
Cuboid E	1	1	24
Cuboid F	1	2	12
Cuboid G			
Cuboid H			
Cuboid I			
Cuboid J			

Key Stage 3: 2004 Paper 2 Level 4-6

13.

2. Here is a shaded shape on a centimetre square grid.
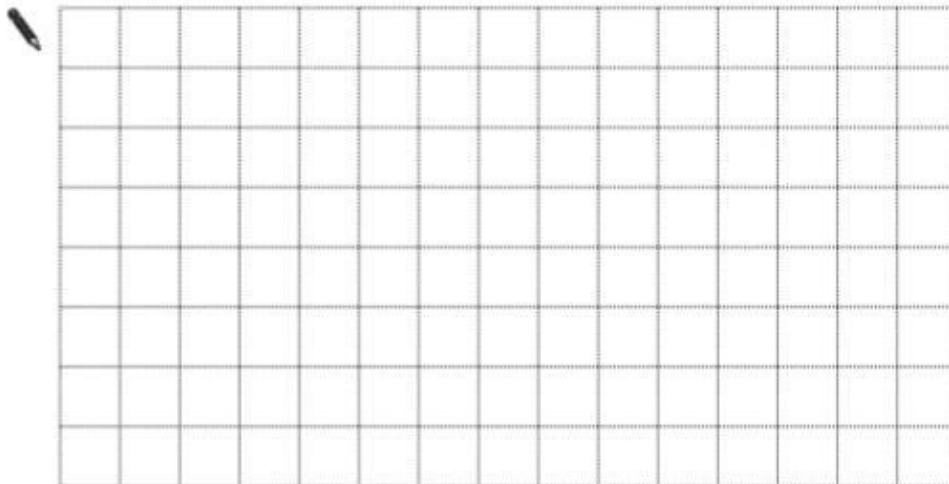

(a) What is the area of the shaded shape?

.... cm^2

(b) Now draw a **rectangle** that has the **same area** as the shaded shape.
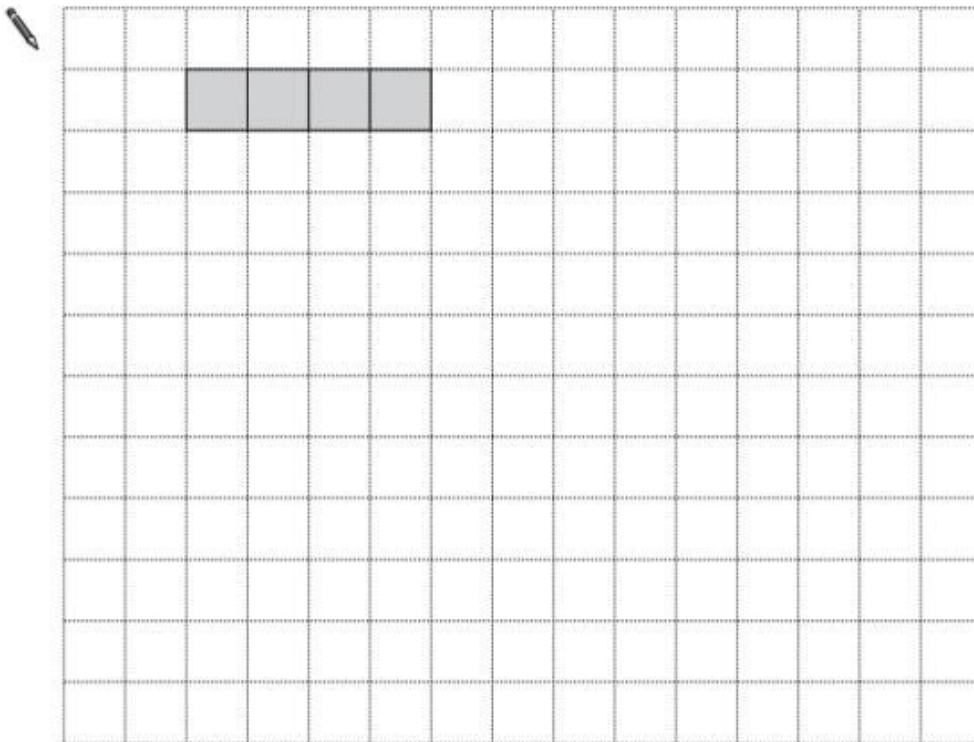
Key Stage 3: 2005 Paper 1 Level 3-5

14.

6. Without reflections or rotations,
three squares can join side-to-side to make only **two different** shapes.
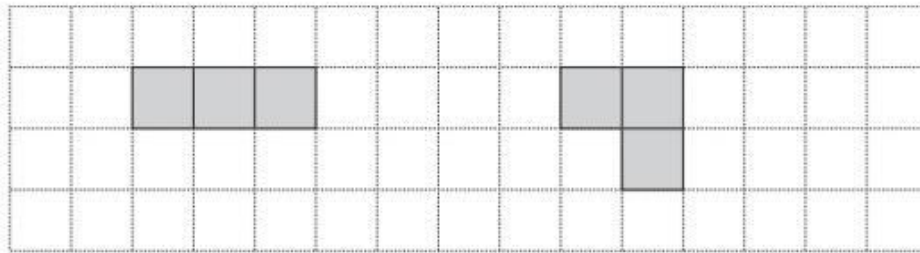
Square grid

Without reflections or rotations,
four squares can join side-to-side to make only **five different** shapes.

Complete the five different shapes on the grid below.
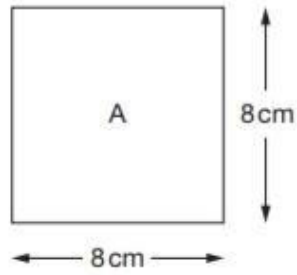The first one is done for you.

3 marks

Square grid

Key Stage 3: 2006 Paper 1 Level 3-5

15.

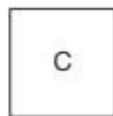**15.** (a)   I have a square piece of paper.

The diagram shows information about this square labelled A.

A
8 cm
8 cm

I fold square A **in half** to make rectangle B.

B

Then I fold rectangle B **in half** to make square C.

C

Complete the table below to show the area and perimeter of each shape.

	Area	Perimeter
Square A	cm²	cm
Rectangle B	cm²	cm
Square C	cm²	cm

(b) I start again with square A.

A   8cm

8cm

Then I fold it **in half** to make triangle D.

D

What is the **area** of triangle D?

_____ cm²

(c) One of the statements below is true for the **perimeter** of triangle D.

Tick (✓) the correct one.

The perimeter is less than 24cm. ☐

The perimeter is 24cm. ☐

The perimeter is greater than 24cm. ☐

Explain your answer.

Key Stage 3: 2006 Paper 2 Level 3-5

16.

11. The grids in this question are centimetre square grids.

For each shape on the left, draw a **rectangle** that has the **same area**.

The first one is done for you.

Shape   **Rectangle**

1 mark

1 mark

17.

9. (a) I have a square piece of paper.

The diagram shows information about this square labelled A.

A 8 cm
8 cm

I fold square A **in half** to make rectangle B.

B

Then I fold rectangle B **in half** to make square C.

C

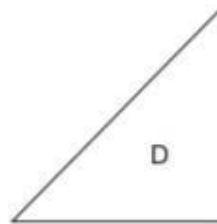Complete the table below to show the area and perimeter of each shape.

	Area	Perimeter
Square A	cm²	cm
Rectangle B	cm²	cm
Square C	cm²	cm

3 marks

(b) I start again with square A.

A   8cm

8cm

Then I fold it **in half** to make triangle D.

D
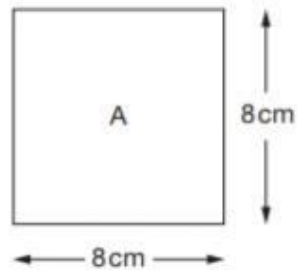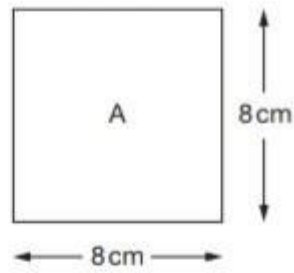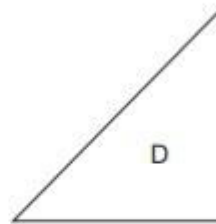
What is the **area** of triangle D?

_____ cm²

1 mark

(c) One of the statements below is true for the **perimeter** of triangle D.

Tick (✓) the correct one.

The perimeter is less than 24 cm. ☐

The perimeter is 24 cm. ☐

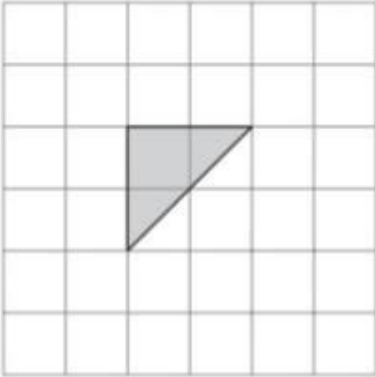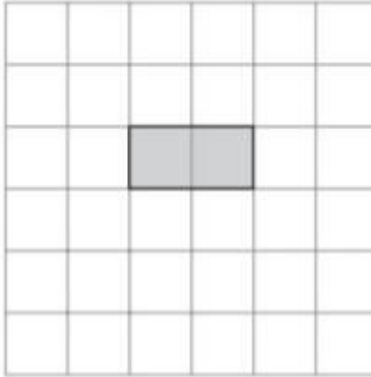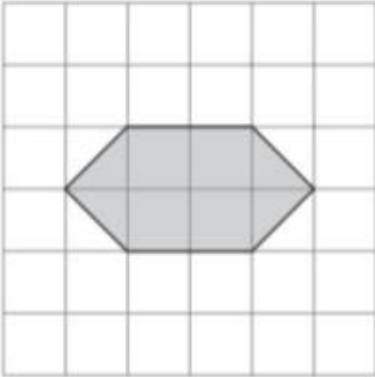The perimeter is greater than 24 cm. ☐

Explain your answer.

1 mark

Key Stage 3: 2007 Paper 1 Level 3-5

18.

12. The shape below is a regular pentagon.

All five sides are exactly the same length.
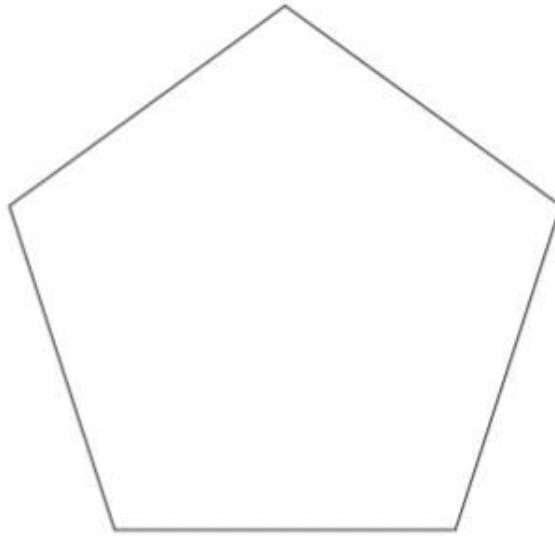
Measure accurately one of the sides, then work out the **perimeter** of the pentagon.

Perimeter =	cm

1 mark

1 mark

1 mark

Key Stage 3: 2007 Paper 2 Level 3-5

19.

11. The scale drawing shows three leaves from different trees.

The drawing on the right shows the leaves drawn on top of each other.

| Oak | Beech | Willow |

(a) Compare the **areas** of the leaves.

Write the leaves in order, **smallest area first**.

✎ _____ _____ _____   1 mark

smallest   largest
area   area

(b) Now compare the **perimeters** of the leaves.

Write the leaves in order, **smallest perimeter first**.

✎ _____ _____ _____   1 mark

smallest   largest
perimeter   perimeter

20

24. Here is a rectangle.

8 cm

2 cm

Not drawn
accurately

(a) A **square** has the **same area** as this rectangle.

What is the **side length** of this square?

_____ cm

1 mark

(b) A **different square** has the **same perimeter** as this rectangle.

What is the **side length** of this square?

_____ cm

1 mark

Key Stage 3: 2007 Paper 1 Level 4-6

21.

5. The shape below is a regular pentagon.

All five sides are exactly the same length.

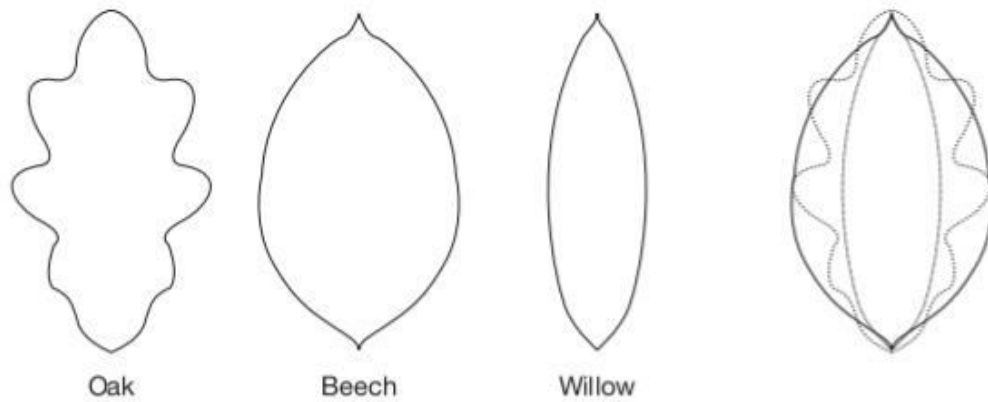Measure accurately **one** of the sides, then work out the **perimeter** of the pentagon.

Perimeter =	cm

Key Stage 3: 2007 Paper 2 Level 4-6

22.

4. The scale drawing shows three leaves from different trees.

The drawing on the right shows the leaves drawn on top of each other.

Oak   Beech   Willow

(a) Compare the **areas** of the leaves.

Write the leaves in order, **smallest area first**.

✎ _____   _____   _____   1 mark

    smallest   largest

     area   area

(b) Now compare the **perimeters** of the leaves.

Write the leaves in order, **smallest perimeter first**.

✎ _____   _____   _____   1 mark

    smallest   largest

   perimeter   perimeter

23.

17. Here is a rectangle.

8 cm

2 cm

Not drawn accurately

(a) A **square** has the **same area** as this rectangle.

What is the **side length** of this square?

_____ cm

1 mark

(b) A **different square** has the **same perimeter** as this rectangle.
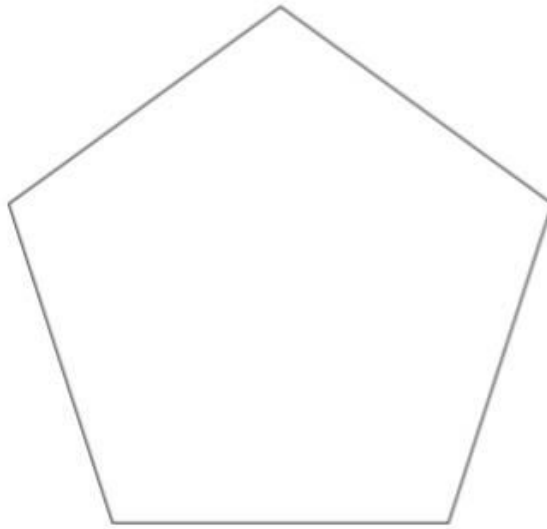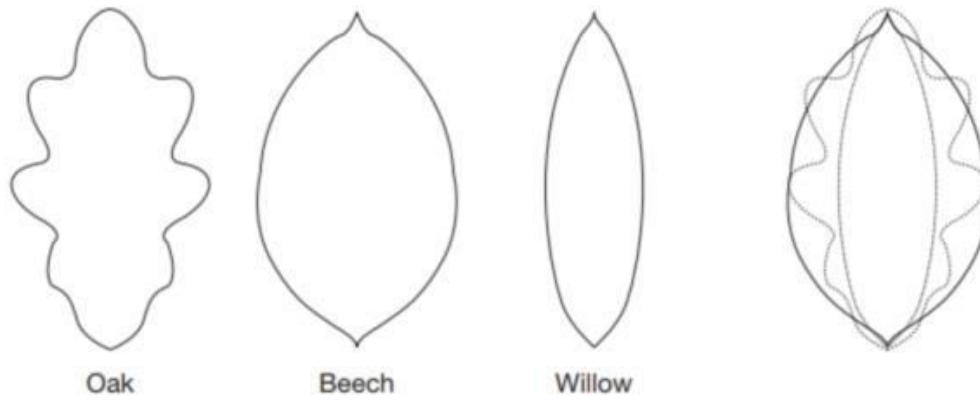
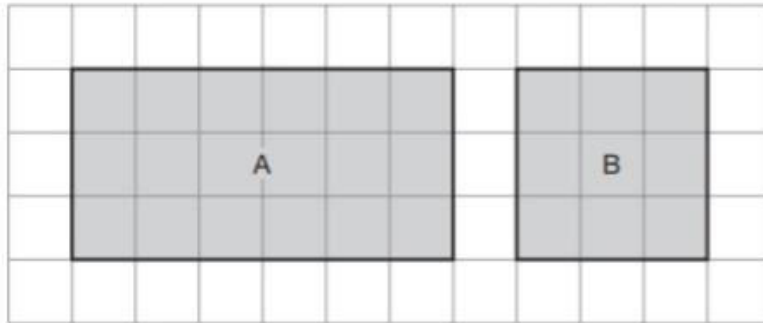What is the **side length** of this square?

_____ cm

1 mark

Key Stage 3: 2008 Paper 2 Level 3-5

24.

17. Look at the shaded shapes drawn on a square grid.

(a) Nick says:

> The **area** of rectangle A is **double** the area of square B.

Is he correct?

☐ Yes   ☐ No

Explain your answer.

(b) Alice says:

> The **perimeter** of rectangle A is **double** the perimeter of square B.
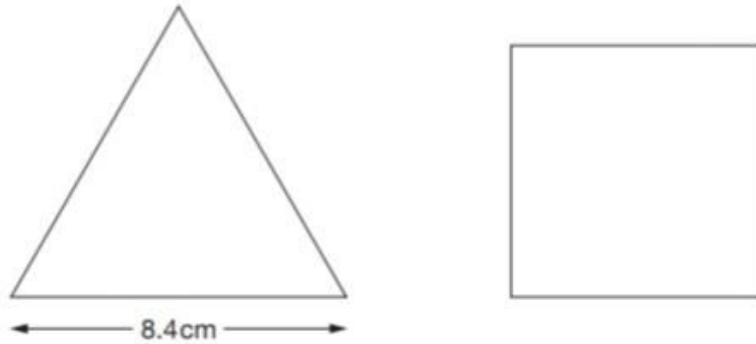
Is she correct?

☐ Yes   ☐ No

Explain your answer.

25.

27. The diagrams show an **equilateral triangle** and a **square**.

The shapes are not drawn accurately.

The side length of the equilateral triangle is 8.4cm.

The **perimeter** of the square is the **same** as the perimeter of the equilateral triangle.
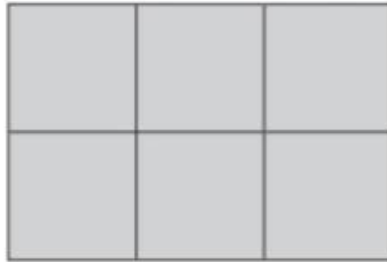
Work out the **side length** of the square.

	cm

2 marks

Key Stage 3: 2008 Paper 1 Level 4-6

26.

23. The diagram shows a square with a **perimeter** of **12cm**.

Not drawn
accurately

Six of these squares fit together to make a rectangle.

Not drawn
accurately

What is the **area** of the **rectangle**?

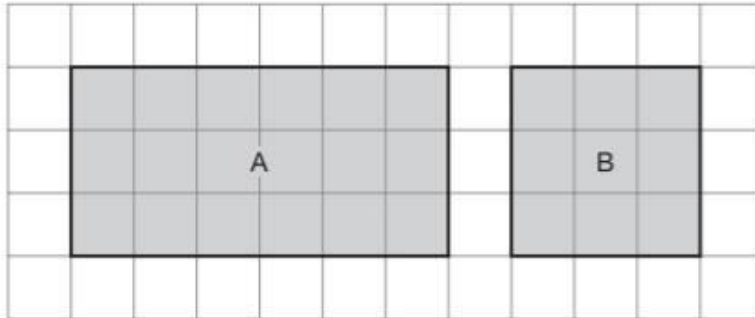You **must** give the correct unit with your answer.

1 mark

1 mark

27.

9.   Look at the shaded shapes drawn on a square grid.

(a)   Nick says:

> The **area** of rectangle A is **double** the area of square B.

Is he correct?

☐ Yes   ☐ No

Explain your answer.

1 mark

(b)   Alice says:

> The **perimeter** of rectangle A is **double** the perimeter of square B.

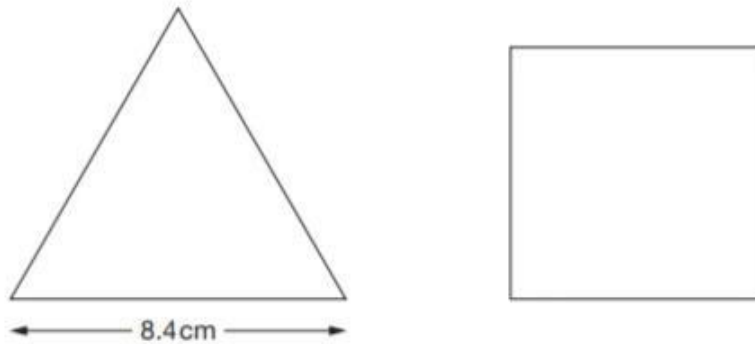Is she correct?

☐ Yes   ☐ No

Explain your answer.

1 mark

28.

19. The diagrams show an **equilateral triangle** and a **square**.

The shapes are not drawn accurately.

The side length of the equilateral triangle is 8.4cm.

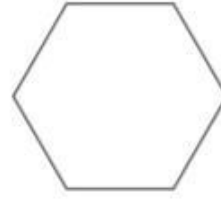The **perimeter** of the square is the **same** as the perimeter of the equilateral triangle.

Work out the **side length** of the square.

[ ] cm

2 marks

29.

25. (a) The **perimeter** of a regular hexagon is $42a + 18$

Write an expression for the length of **one** of its sides.

✎ _____

1 mark

(b) The **perimeter** of a different regular polygon is $75b - 20$

The length of one of its sides is $15b - 4$

How many sides does this regular polygon have?

✎ _____

1 mark

(c) The **perimeter** of a square is $4(c - 9)$

Find the perimeter of the square when $c = 15$
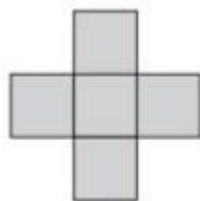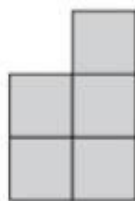
✎ _____

1 mark

Key Stage 3: 2009 Paper 2 Level 4-6

30.

22. Shape A and shape B are each made from five identical squares.

A   B

Not drawn
accurately

The **perimeter** of shape A is **72cm**.

Work out the **perimeter** of shape B.

_____cm

2 marks

Key Stage 3: 2010 Paper 2 Level 4-6

31.

18. The shaded rectangle is **twice as long** as it is wide.

The **perimeter** of the rectangle is **30cm**.

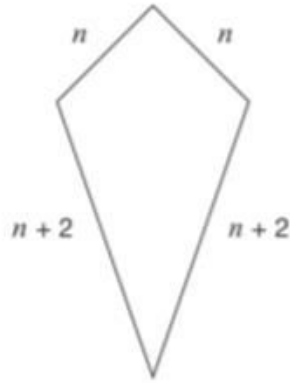Not drawn
accurately

What is the **area** of the rectangle?

_____ cm²

2 marks

32.

19. The diagram shows a kite.

The side lengths are in centimetres.

n

n

n + 2

n + 2

Not drawn accurately

(a) When *n* = 9, what is the perimeter of the kite?

_____ cm

1 mark

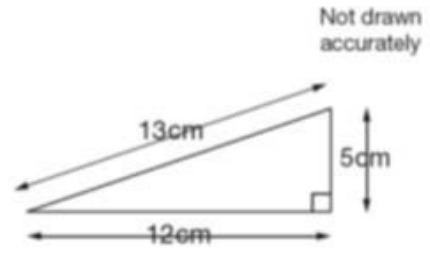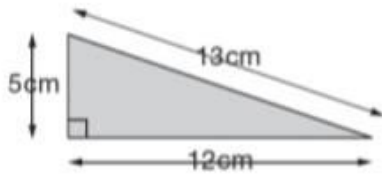(b) When the perimeter of the kite is **100 cm**, what is the value of *n*?

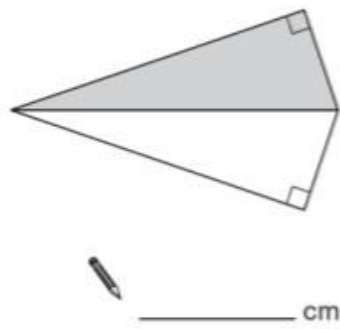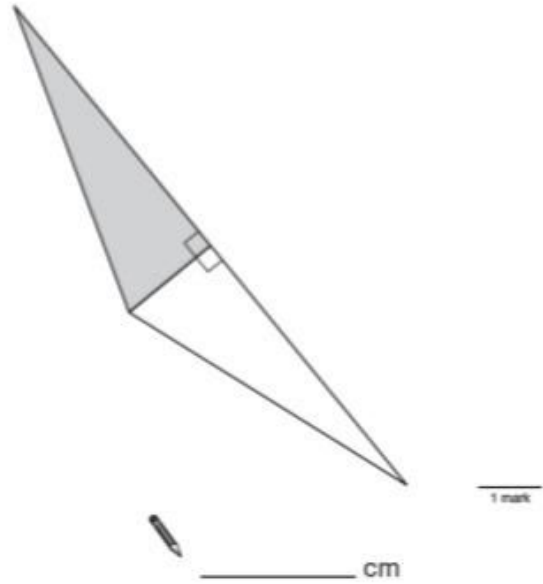*n* = _____

2 marks

Key Stage 3: 2011 Paper 2 Level 4-6

33.

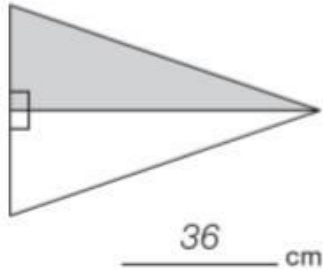**8.** Here are two triangles.

13cm
5cm
12cm

13cm
5cm
12cm

The triangles fit together in different ways to make larger shapes.

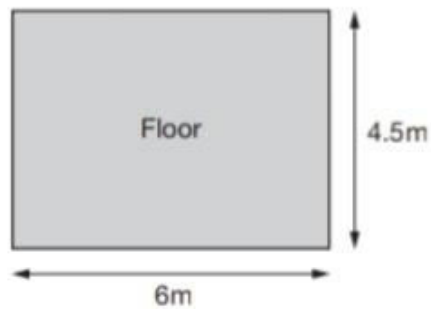Write the perimeter of each larger shape below.

The first one is done for you.

_36_ cm

_____ cm

1 mark

_____ cm

_____ cm

1 mark

34.

17. Kate wants to decorate **all four walls** of a rectangular room.

Here are the dimensions of her room.

Floor 4.5m

6m

The table shows the number of rolls of wallpaper needed to decorate different sized rooms.

Distance around the room	Number of rolls needed
10m	6
12m	7
14m	8
16m	9

Kate has **11 rolls** of wallpaper.
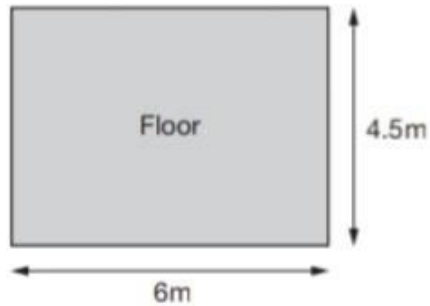
Does she have enough to wallpaper her room?

Yes ☐   No ☐

Explain your answer.

2 marks

35.

17. Kate wants to decorate **all four walls** of a rectangular room.

Here are the dimensions of her room.

Floor

4.5m

6m

The table shows the number of rolls of wallpaper needed to decorate different sized rooms.

Distance around the room	Number of rolls needed
10m	6
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Kate has **11 rolls** of wallpaper.

Does she have enough to wallpaper her room?

☐ Yes   ☐ No

Explain your answer.

_____

2 marks

36.

20. This large rectangle is made from white squares and smaller grey squares.

Not drawn
full size

The area of one **grey** square is **1cm²**

What is the area of the large rectangle?

_____ cm²