Maths Activities- Area and Perimeter

Revision links:

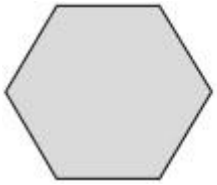
- https://primarysite-prod-sorted.s3.amazonaws.com/tylers-green-middle-school/UploadedDocument/ab68820a53ff45e6862c5dddd9b2905a/maths-booster-lesson-9-area-and-perimeter.ppt
- https://www.satspapersguide.co.uk/sats-information/free-sats-resources/free-maths-sats-resources/area-and-perimeter/
- https://www.bbc.co.uk/bitesize/topics/zjbg87h
- https://nrich.maths.org/9028

Warming up *

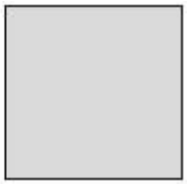
Q1.

These two shapes have the **same** perimeter.

regular hexagon



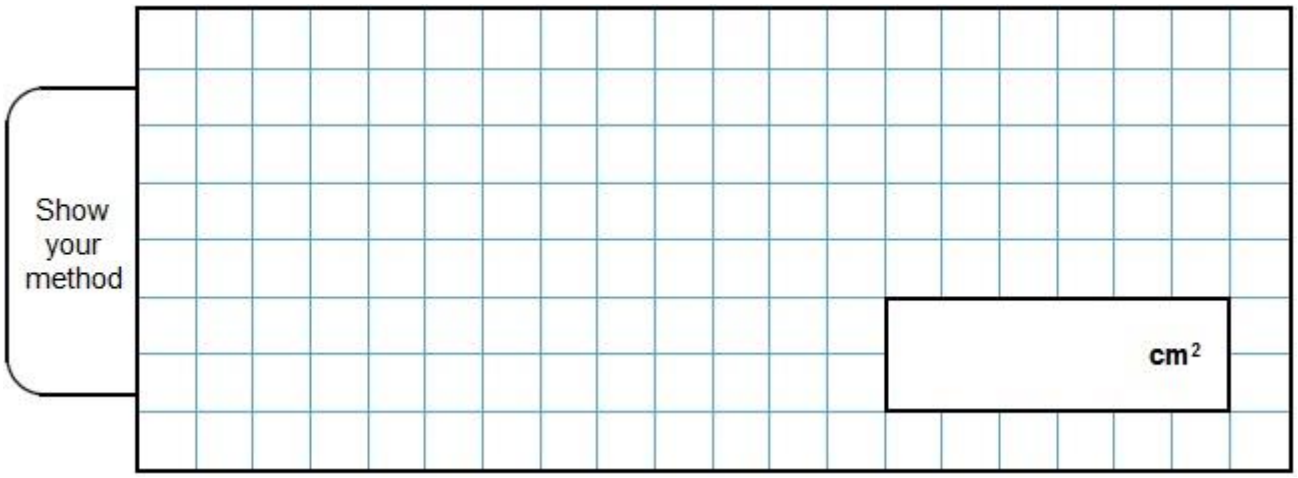
square



Not actual size

The length of each side of the **hexagon** is **8** centimetres.

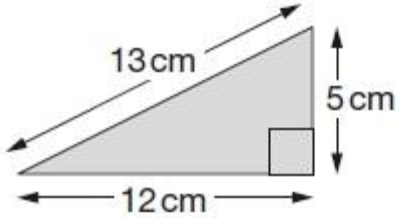
Calculate the **area** of the **square**.



2 marks

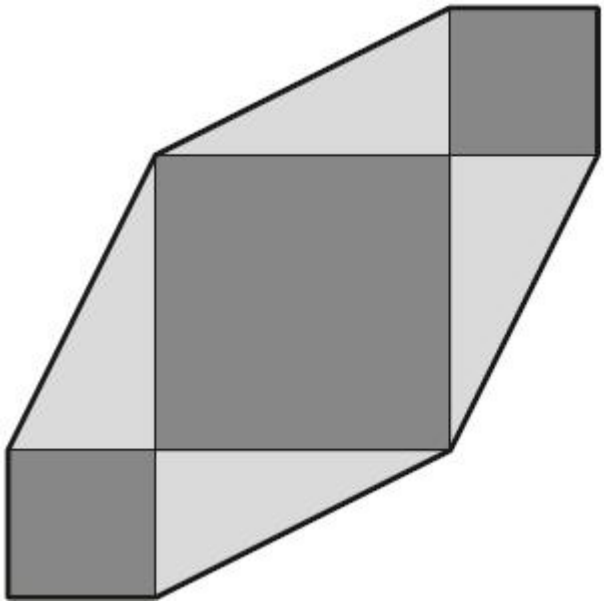
Q2.

Chen has some right-angled triangular tiles.



Not actual size

He makes this shape with four of his triangular tiles and three square tiles.



Not actual size

What is the **perimeter** of Chen's shape?

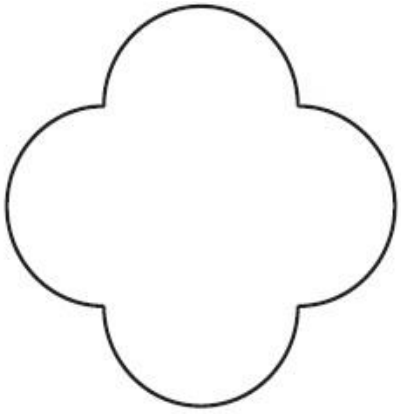
Show your method

cm

2 marks

Q3.

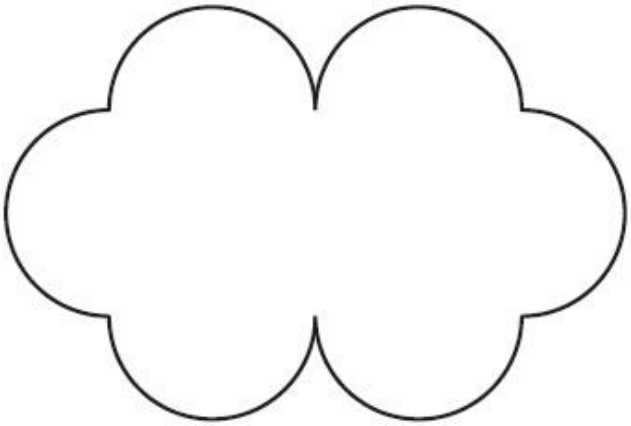
This shape is made out of four identical curves.



Not actual size

The perimeter of the shape is 28 centimetres.

A new shape is made out of curves of the same size.



What is the perimeter of the new shape?

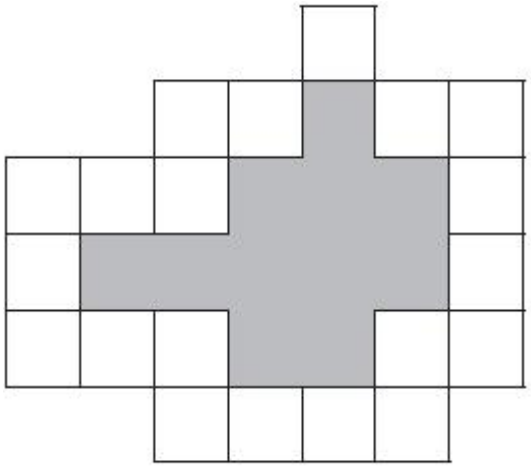
Show your method

cm

2 marks

Q4.

Here is a set of 20 squares around a shaded space.



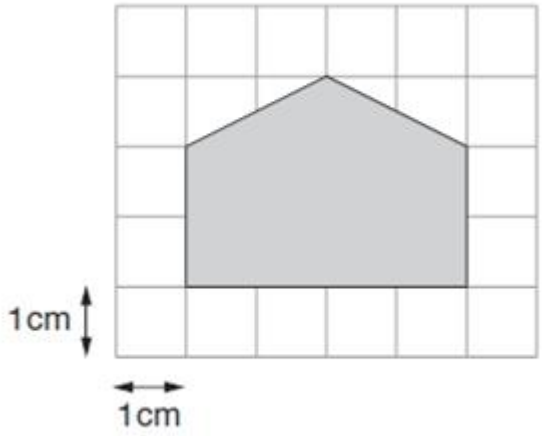
What is the area of the shaded space?

squares

1 mark

Q5.

Here is a shaded shape on a 1 cm square grid.



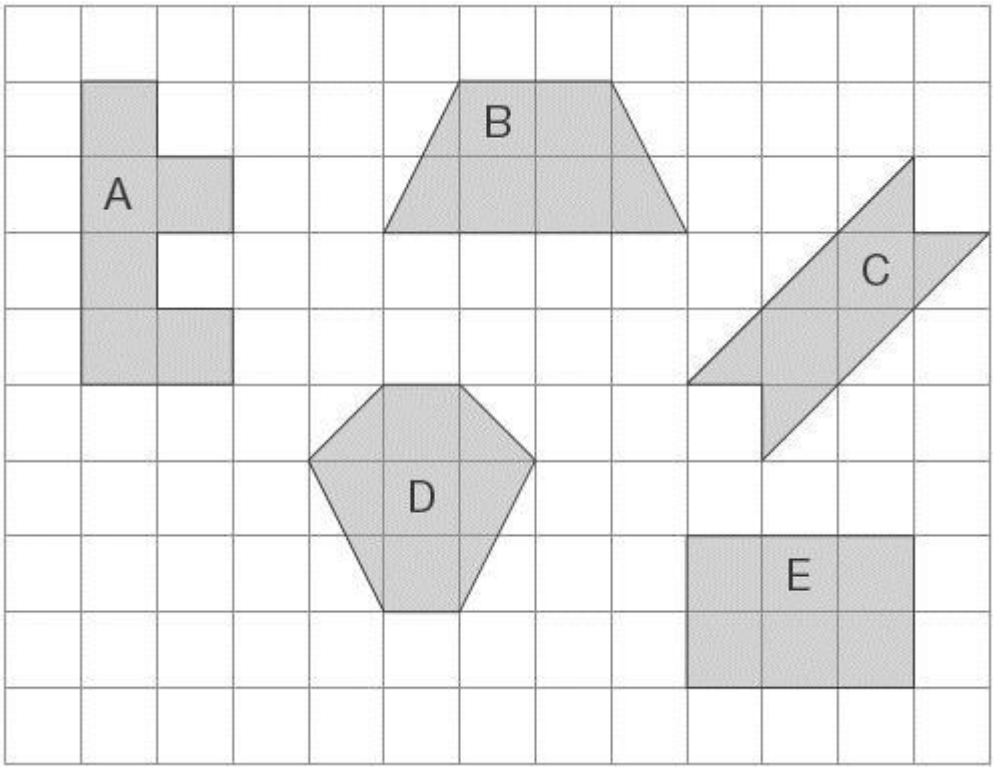
What is the **area** of the shaded shape?

cm^2

1 mark

Q6.

Here are some shapes on a 1cm square grid.



What is the **perimeter** of shape A?

cm

1 mark

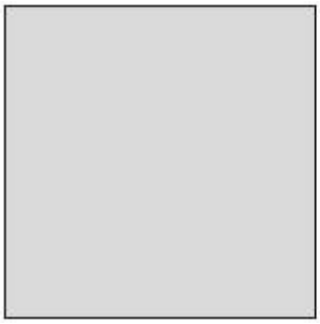
Write the letter of the shape that has the **smallest area**.

1 mark

Feeling confident **

Q7.

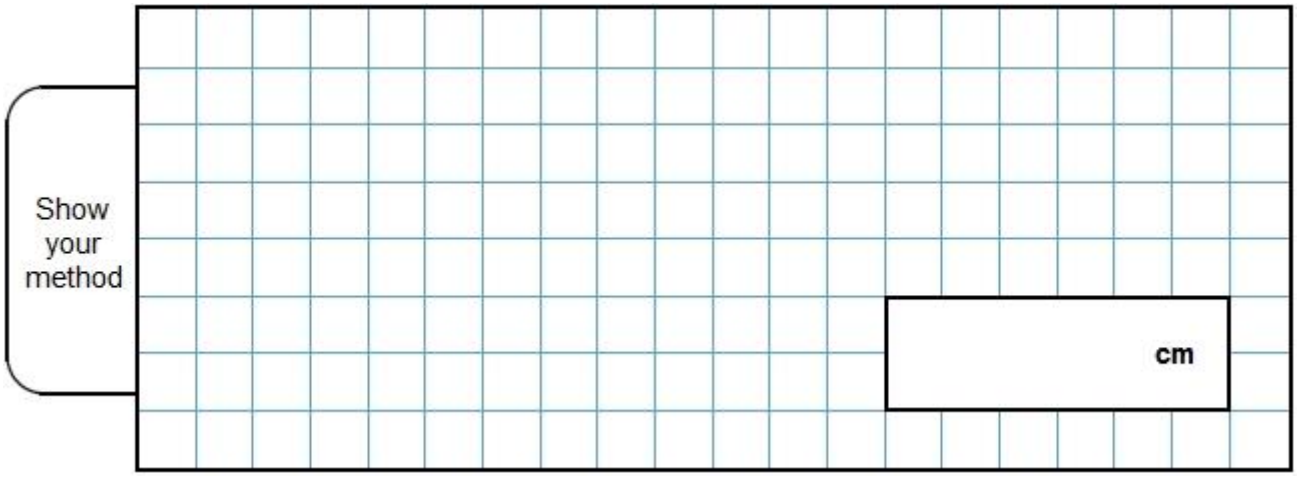
The **area** of this square is 36 cm^2.



Not actual size

The square is cut into quarters to create 4 identical rectangles.

What is the **perimeter** of **one** of the small rectangles?

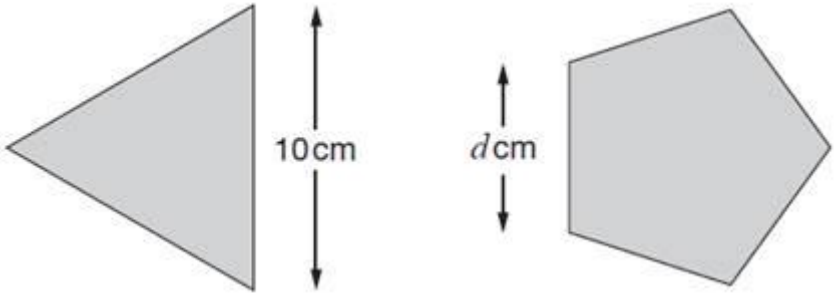


2 marks

Q8.

Here are an equilateral triangle and a regular pentagon.

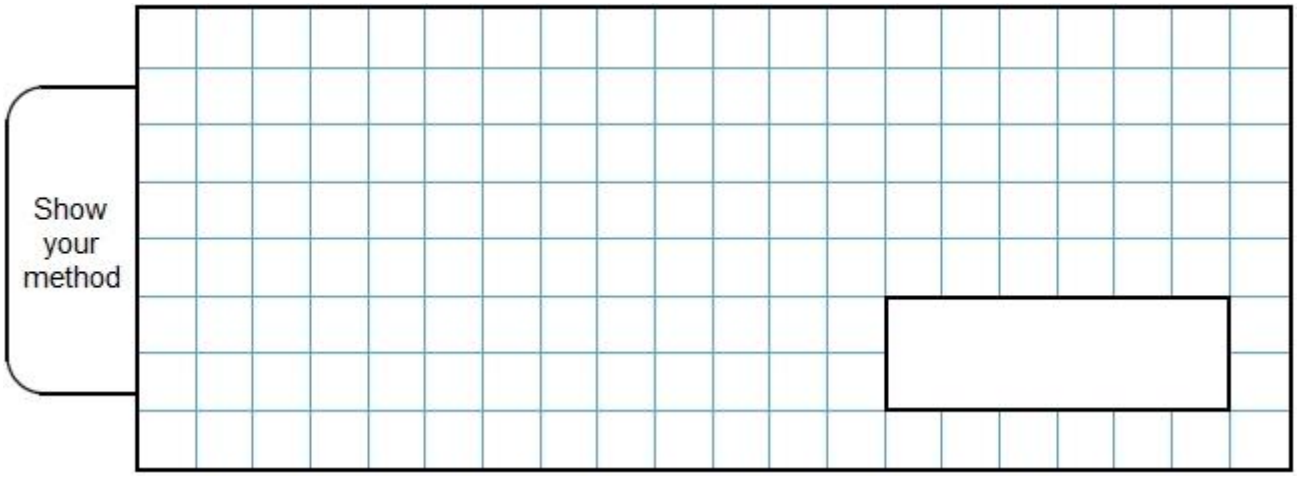
Not actual size



Each side of the triangle is 10 cm
Each side of the pentagon is d cm

The perimeter of the pentagon is 4 centimetres more than the perimeter of the triangle.

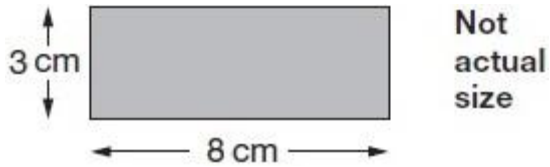
What number does d represent?



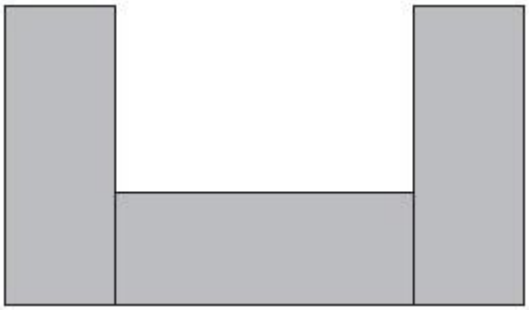
2 marks

Q9.

Alfie has some rectangles.



He makes this shape using three of the rectangles.



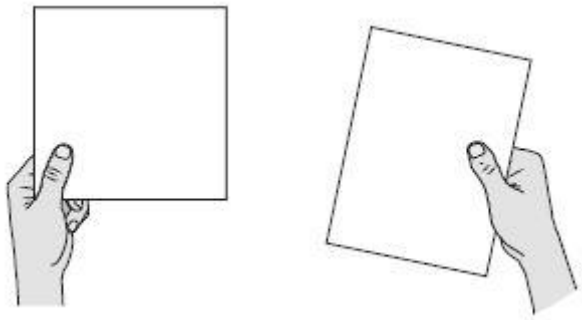
What is the **perimeter** of Alfie's shape?

Show your method

cm

2 marks

Q10.



A square tile measures 20 cm by 20 cm.

A rectangular tile is 3 cm **longer** and 2 cm **narrower** than the square tile.

What is the **difference in area** between the two tiles?

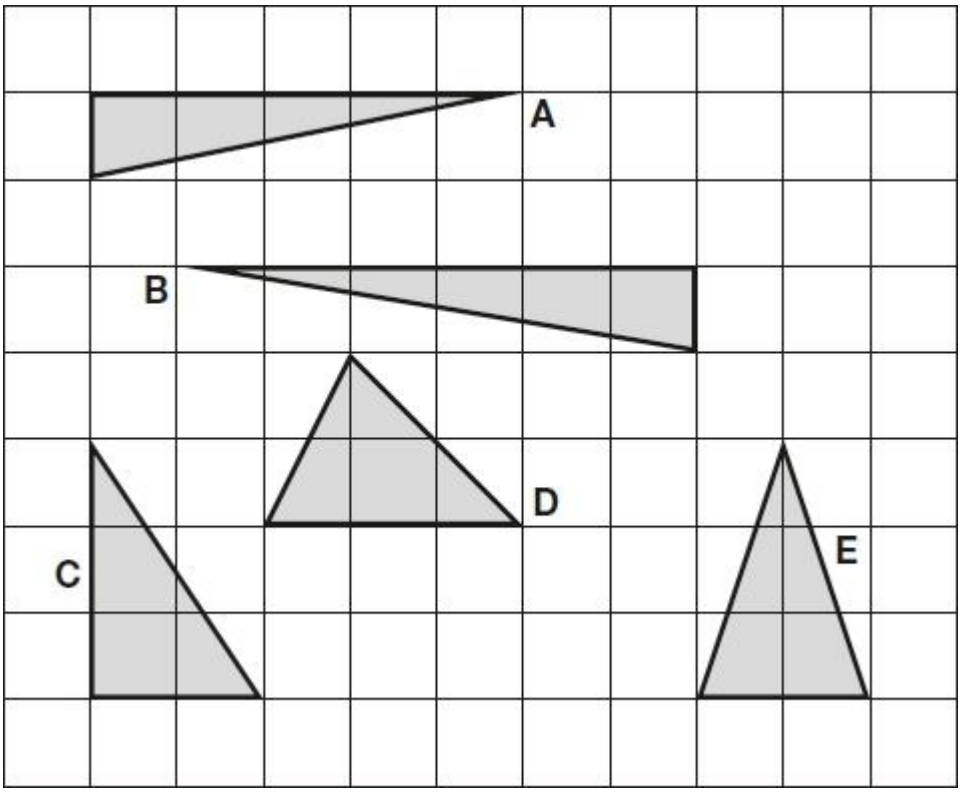
Show your method

cm²

3 marks

Q11.

Here are five triangles on a square grid.



Four of the triangles have the same area.

Which triangle has a **different** area?

_____

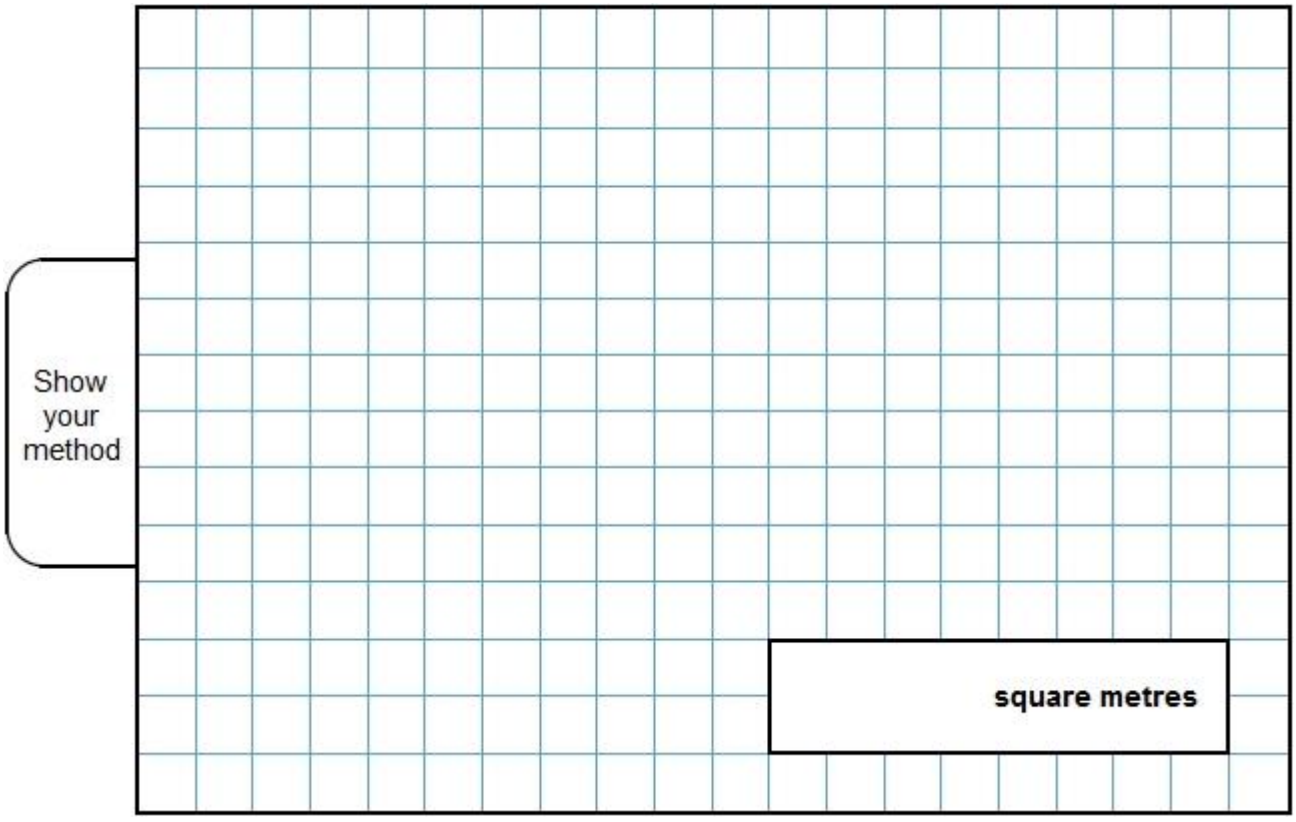
1 mark

Q12.

The area of a rugby pitch is 6,108 square metres.

A football pitch measures 112 metres long and 82 metres wide.

How much larger is the area of the football pitch than the area of the rugby pitch?



3 marks

Challenge ***

Q13.

The following quadrilaterals all have a **perimeter of 36 cm**.

Here is a table to show the length of each side.

Complete the table.

One quadrilateral is done for you.

	Side lengths			
square	9 cm	9 cm	9 cm	9 cm
rectangle	3 cm			
rhombus	9 cm			
kite	10 cm			

2 marks

Q14.

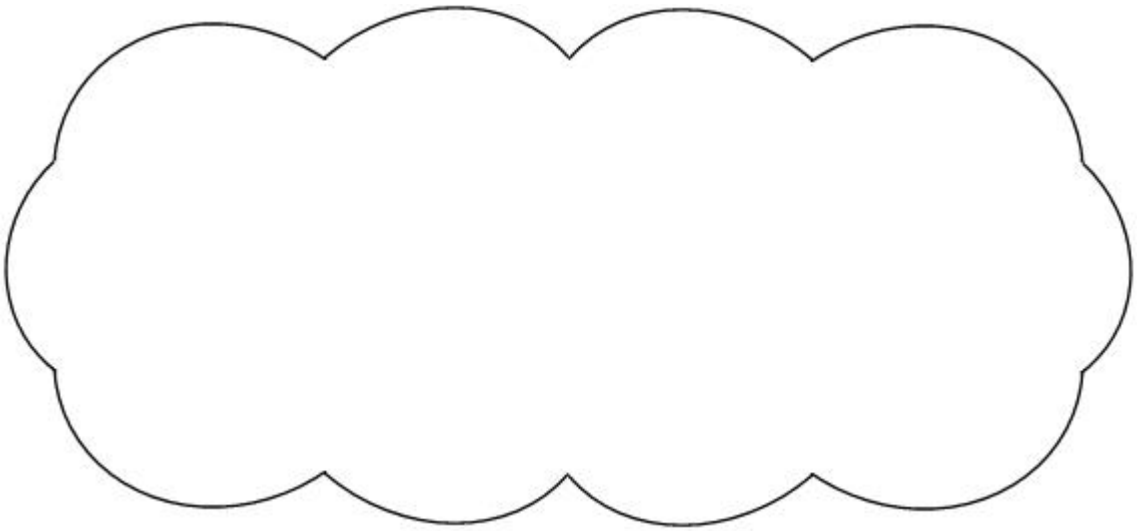
Megan says,

'If two rectangles have the same perimeter, they must have the same area.'

Is she correct?
Circle **Yes** or **No**.

Yes / No

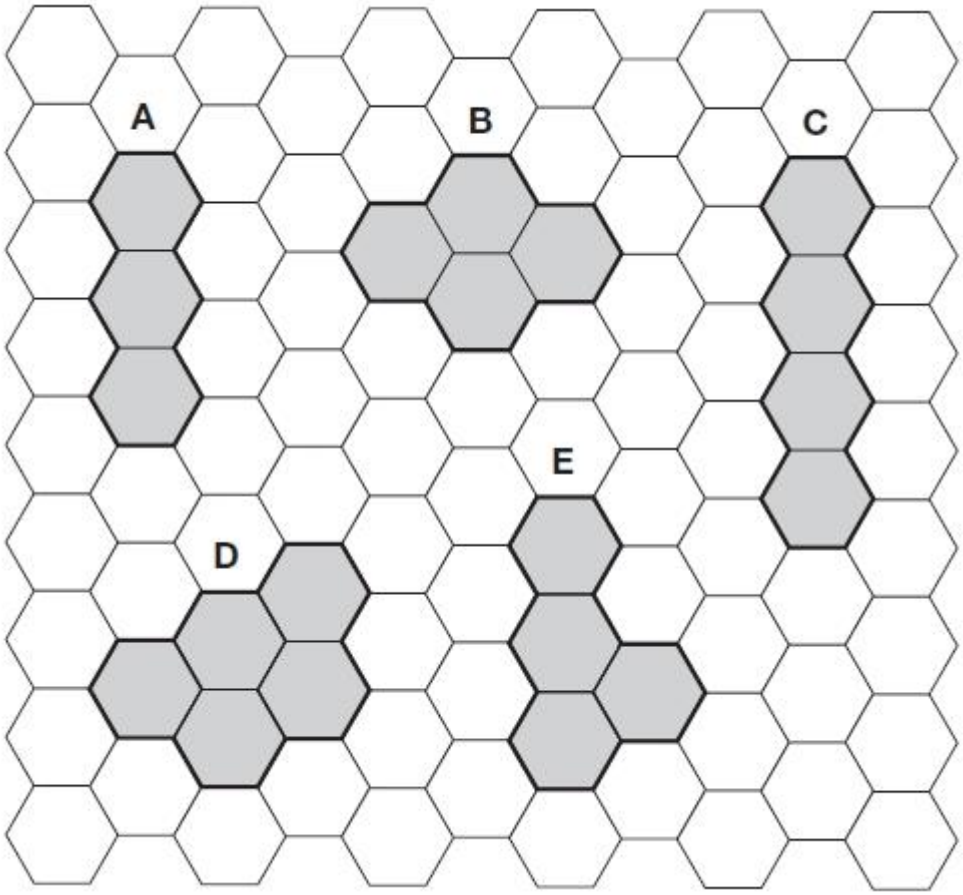
Explain how you know.



1 mark

Q15.

Here are five shapes on a regular grid.



Which shape has the longest **perimeter**?

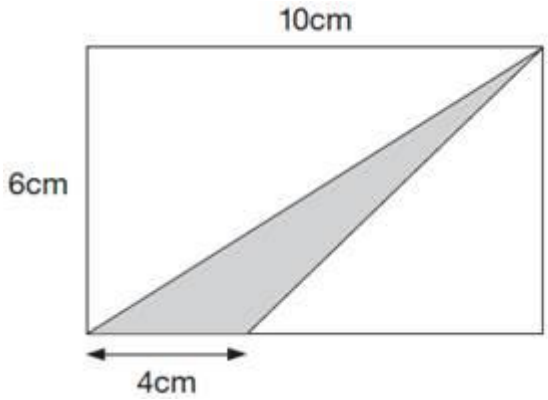
1 mark

Which shape has only one **line of symmetry**?

1 mark

Q16.

The diagram shows a shaded triangle inside a rectangle.



Not actual size

What is the area of the shaded triangle?

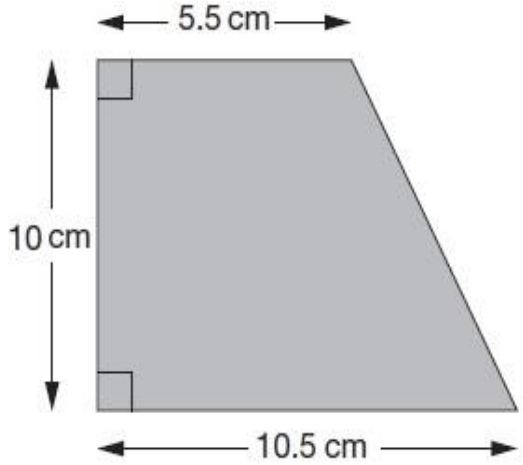
Show your method

cm²

2 marks

Q17.

Here is a trapezium with a height of 10 centimetres.



Not actual size

The parallel sides are 5.5 cm long and 10.5 cm long.

Find the **area** of the trapezium.

Show your method

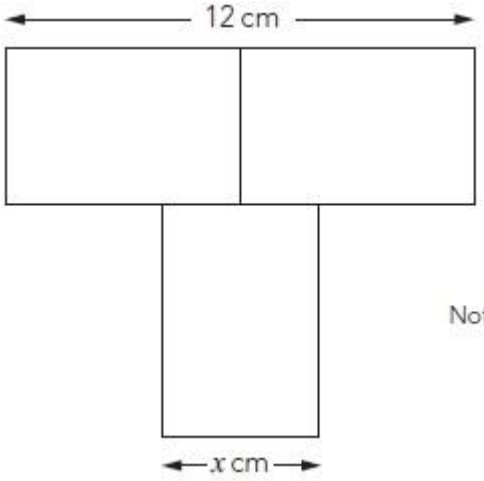
cm^2

2 marks

Q18.

Here is a T-shape made from 3 identical rectangles.

The area of the T-shape is **90 cm^2**



Not to scale

Work out the value of x

Show your method

cm

2 marks

Warming up answers *

Q1.

Award **TWO** marks for the correct answer of 144

If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g.

- 8 × 6 = 48
  48 ÷ 4 = 13 (error)
  13 × 13 = 169

OR

Award **ONE** mark for:

- evidence for the side length of the square calculated correctly, i.e. 12

*Answer need not be obtained for the award of **ONE** mark.*

Up to 2m

[2]

Q2.

Award **TWO** marks for the correct answer of 72

If the answer is incorrect, award **ONE** mark for evidence of appropriate working, eg:

- 13 × 4 = 52

  5 × 4 = 20

  52 + 20 = wrong answer

*Working must be carried through to reach an answer for the award of **ONE** mark.*

Up to 2

[2]

Q3.

Award **TWO** marks for the correct answer of 42

If the answer is incorrect award **ONE** mark for evidence of appropriate working, eg:

- 28 ÷ 4 = 7

  7 × 6 = wrong answer

OR

- 28 ÷ 2 = 14

14 + 28 = wrong answer

*Working must be carried through to reach an answer for the award of **ONE** mark.*

Up to 2m

[2]

Q4.

11

Accept 11 cm²

[1]

Q5.

10

[1]

Q6.

(a) 14

1

(b) C

Accept 5

1

[2]

Feeling confident answers **

Q7.

15

2

or

6(cm) and 1.5(cm) seen (*the dimensions of the rectangle*)

OR

Shows or implies a complete correct method, eg:

- $\sqrt{36}$ = 8 (*error*)
  8 ÷ 4 = 2
  2 × (8 + 2)

- 6 × 6 = 36
  6 ÷ 4 = 1.2 (*error*)
  6 + 1.2 + 6 + 1.2

  ***Do not accept** confusion between area and perimeter, ie:*
  - *side of square is 36 ÷ 4 = 9 (error)*
    2 × (9 + 2.25)

1

[2]

Q8.

6.8

Accept equivalent fractions and decimals, eg:

- $6\frac{4}{5}$
- $\frac{34}{5}$

2

or

Shows or implies a complete, correct method, eg:

- $5d = 3 \times 10 + 4$
  $5d = 34$
  $d = 34 \div 5$

- $3 \times 10 = 40$ *(error)*
  $40 + 4 = 44$
  $44 \div 5 = 8.4$ *(error)*

- $30 + 4 = 34$
  $34 \div 5$

***Do not accept** incorrect methods, eg:*
where the perimeter of the pentagon is treated as being 4cm less *than the perimeter of the triangle:*

- *30 – 4 = 26*
  26 ÷ 5 = 5.2

1

[2]

Q9.

Award **TWO** marks for the correct answer of 54

If the answer is incorrect, award **ONE** mark for evidence of appropriate working, eg

$8 \times 4 = 32$

$3 \times 4 = 12$

$5 \times 2 = 10$

$32 + 12 + 10$ = wrong answer

*Working must be carried through to reach an answer for the award of **ONE** mark.*

Up to 2

[2]

Q10.

Award **THREE** marks for the correct answer of 14

If the answer is incorrect, award **TWO** marks for:

- sight of 414 as evidence of 23 × 18 completed correctly

OR

- evidence of an appropriate method with no more than one arithmetic error, e.g.

  20 × 20 = 400

$$\begin{array}{r} 23 \\ \times\ 18 \\ \hline 230 \\ 184 \\ \hline 314 \end{array}$$ *(error)*

  400 − 314 = 86

Award **ONE** mark for evidence of an appropriate method.

*Answer need not be obtained for the award of **ONE** mark.*

A misread of a number may affect the award of marks. No marks are awarded if there is more than one misread or if the mathematics is simplified.

***TWO** marks will be awarded for an appropriate method using the misread number followed through correctly to a final answer.*

***ONE** mark will be awarded for evidence of an appropriate method using the misread number followed through correctly with no more than one arithmetic error.*

Up to 3m

[3]

Q11.

A

Accept alternative unambiguous positive indications of the correct triangle, e.g. $2\frac{1}{2}$ *or 2.5.*

[1]

Q12.

Award **THREE** marks for the correct answer of 3076 square metres.

If the answer is incorrect, award **TWO** marks for:

- sight of 9184 as evidence of the multiplication for the first step completed correctly.

OR

- evidence of an appropriate method which contains no more than **ONE** arithmetical error, e.g:

```
   112
 ×  82
 8960
  224
 9187   (error)

  9187
− 6108
  3079
```

- Award **ONE** mark for evidence of an appropriate method which contains more than **ONE** arithmetical error.

Do not award any marks if the error is in the place value of the multiplication, e.g. the omission of the final zero when multiplying by tens, e.g.

```
   112
 ×  82
  896
  224
```

wrong answer

Commentary: As well as a range of 1 mark and 2 mark questions, one of the questions in a suite of tests may now attract three marks. The solution to a 3 mark question may involve more steps or, as in this example, more complex calculations.

Up to 3m

[3]

Challenge answers ***

Q13.

Completes all three rows correctly, eg:

-

rectangle	3cm	3cm	15cm	15cm
rhombus	9cm	9cm	9cm	9cm
kite	10cm	10cm	8cm	8cm

! Measures

Accept Side lengths in each row may be given in any order

Accept correct values with cm omitted eg, for the rectangle:

- *15 3 15*

2

or

Completes two rows correctly

1

[2]

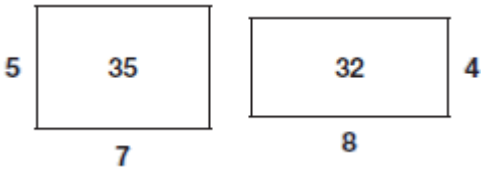
Q14.

Indicates No and gives a correct explanation that includes indicating two different areas, eg:

- A rectangle with sides 6 cm by 2 cm has a perimeter of 16 cm and an area of 12 cm^2 but a rectangle with sides 5 cm and 3 cm has the same perimeter of 16 cm but it has an area of 15 cm^2 which is different so she is not correct

- A square with sides 3 cm by 3 cm and a rectangle with sides 4 cm by 2 cm have the same perimeter of 12 cm but they have different areas of 9 cm^2 and 8 cm^2

Accept minimally acceptable explanation, eg:

- *6 × 2 = 12, 5 × 3 = 15*
- 

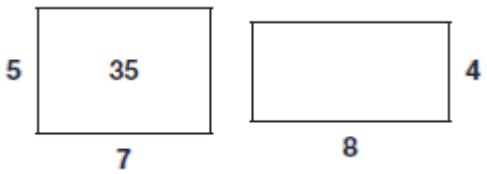
! Ignore any incorrect units given in an otherwise correct explanation, eg:

- *6^2 for 6 cm^2*

! Indicates Yes, or no decision made, but explanation clearly correct

Condone, provided the explanation is more than minimal

***Do not accept** Incomplete or incorrect explanation, eg:*

- *6 × 2, 5 × 3*
- *Two rectangles, one with sides 6 cm by 5 cm and one with sides 8 cm by 3 cm have the same perimeter of 22 cm but they don't have the same area*
- 

[1]

Q15.

(a) C

Accept 18

1

(b) D

1

[2]

Q16.

12

2

or

Shows or implies a complete correct method, eg:

- $4 \times 6 \div 2 = 13$ *(error)*
- $60 - (10 \times 6 \div 2) - (6 \times 6 \div 2)$
- $60 - 48$

1

[2]

Q17.

80

! Measures

2

or

Shows or implies a complete correct method, eg:

- $(10 \times 10.5) - (\frac{1}{2} \times 10 \times 5)$
- $\frac{1}{2}(5.5 + 10.5) \times 10$
- $(10 \times 5.5) + (\frac{1}{2} \times 10 \times 5) = 55 + 22.5$ (*error*)

1

[2]

Q18.

5 cm

2
U1

or

Answer of 2.5

OR

Shows understanding of a correct method even if there are computational errors, eg

- 90 ÷ 3 = 36 (error)

  12 ÷ 2 = 6

  36 ÷ 6 = 6

1

[2]