

Ma

KEY STAGE

3

TIER

4–6

Year 8 mathematics test

Paper 1

Calculator **not** allowed

First name _____

Last name _____

Class _____

Date _____

Please read this page, but do not open your booklet until your teacher tells you to start. Write your name, the name of your class and the date in the spaces above.

Remember

- The test is 1 hour long.
- You **must not** use a calculator for any question in this test.
- You will need a pen, pencil, rubber, ruler and an angle measurer. You may find tracing paper useful.
- Some formulas you might need are on page 2.
- This test starts with easier questions.
- Try to answer all of the questions.
- Write all of your answers and working on the test paper – do not use any rough paper. Marks may be awarded for working.
- Check your work carefully.
- Ask your teacher if you are not sure what to do.

For marking
use only

Total marks	
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Instructions

Answers



This means write down your answer or show your working and write down your answer.



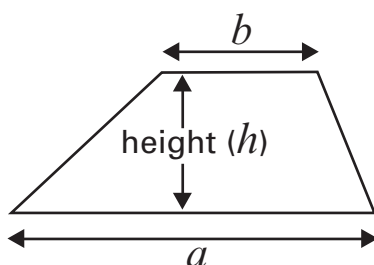
Calculators

You **must not** use a calculator to answer any question in this test.

Formulas

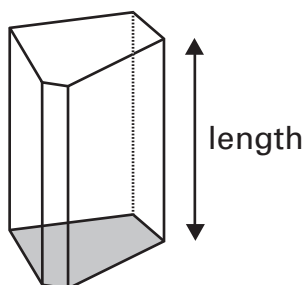
You might need to use these formulas.

Trapezium



$$\text{Area} = \frac{1}{2} (a + b)h$$

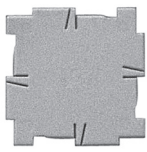
Prism



$$\text{Volume} = \text{area of cross-section} \times \text{length}$$

1

Jan has a lot of these tiles.



Square tiles



Triangle tiles



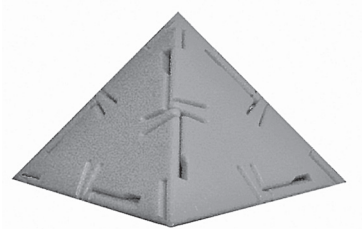
Pentagon tiles

She makes some 3D shapes.
Write what she needs for each 3D shape.
The first is done for you.



Cube

6 square tiles
0 triangle tiles
0 pentagon tiles

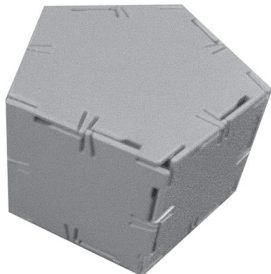


Square-based pyramid



..... square tiles
..... triangle tiles
..... pentagon tiles

1 mark



Pentagonal prism



..... square tiles
..... triangle tiles
..... pentagon tiles

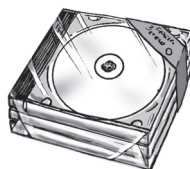
1 mark



2



DVDs
£6.50
each



Pack of three DVDs
£15

- (a) Max wants to buy 8 of these DVDs as cheaply as he can.

How much must he pay?



£ 1 mark

- (b) Lina has £22

What is the greatest number of these DVDs that she can buy?

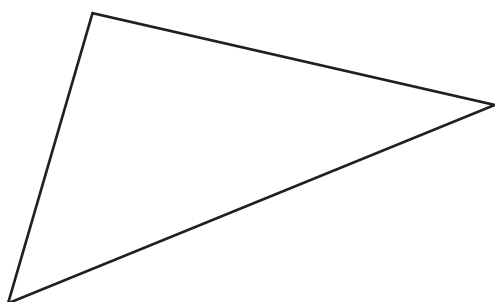


..... 1 mark

3

What is the perimeter of this triangle?

Use a ruler to measure it.



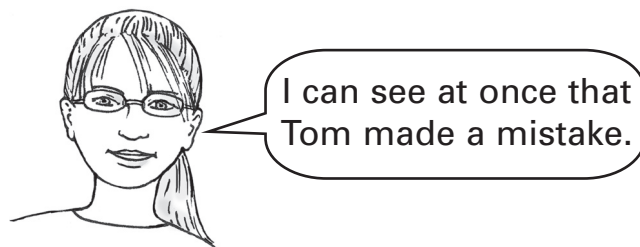
..... centimetres
..... 2 marks

- 4 570 people are going on a bus trip.
A bus can carry 38 passengers.
Tom has to work out how many buses they need.
He does the calculation on his calculator.

Tom says:



Holly says:



- (a) How can Holly see at once that Tom made a mistake?



1 mark

- (b) Put a ring around Tom's mistake.



He added 38 and 570

He subtracted 38 from 570

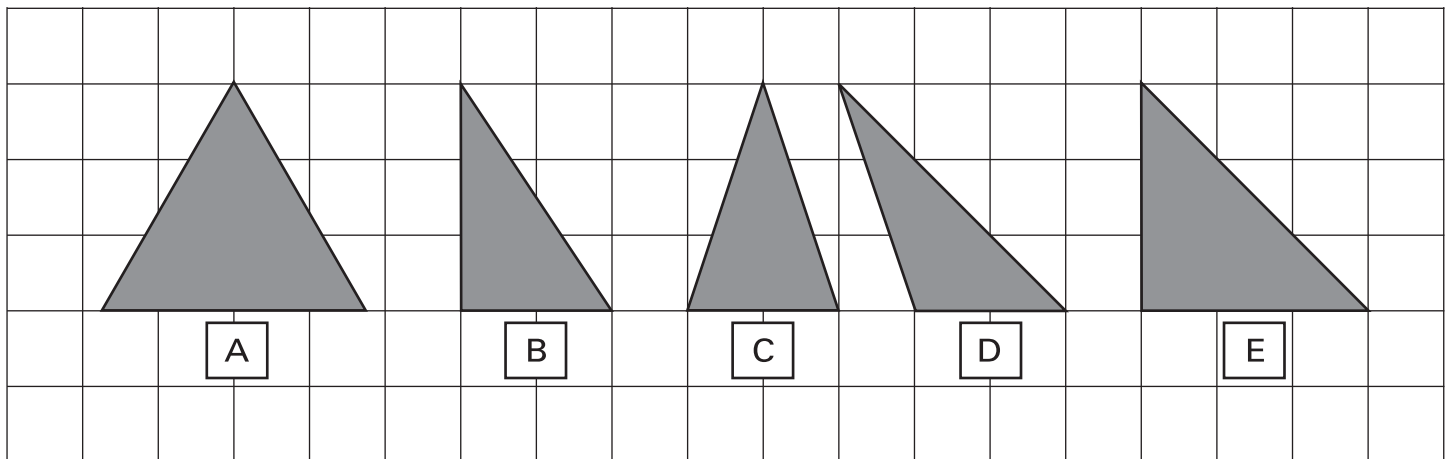
He multiplied 38 by 570

He divided 38 by 570

1 mark



5 (a) Look at these five triangles.

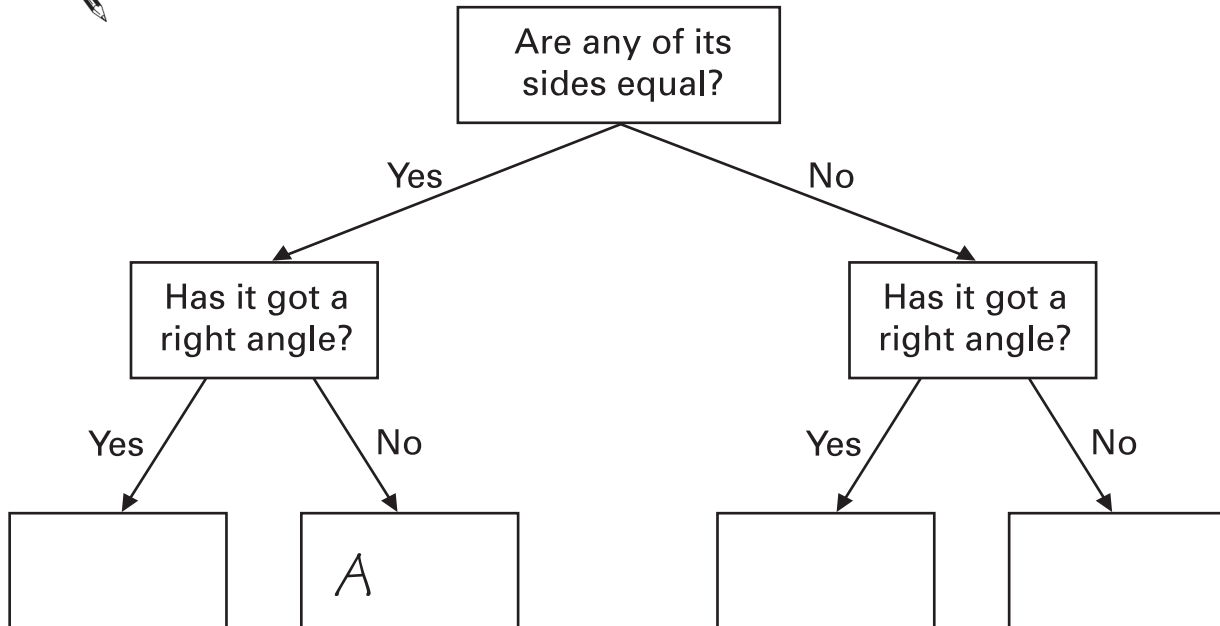


Decide where each triangle should go in the sorting diagram.

Write the letter of each triangle in the correct box.

You can put more than one letter in each box.

Triangle A is done for you.



.....
.....
2 marks

(b) Decide where each triangle should go in the sorting diagram.

Write the letter of each triangle in the correct box.

You can put more than one letter in each box.

The first is done for you.



	Right angle	No right angle
Some equal sides		A
No equal sides		

1 mark



- 6 (a) The numbers in this sequence go up in equal steps.

Write the missing numbers.



40, , , 100, , ...

1 mark

- (b) Each number in this sequence is half of the number before.

Write the missing numbers.



, 20, 10, 5, , , ...

2 marks

7

A machine makes 10000 coins in a minute.



How many coins does the machine make in one hour?



.....

1 mark

8

Look at these digit cards.

2

3

5

9

Use **two** of the cards to make the answer to this calculation as **great** as possible.



÷

1 mark



9 This chart shows the opening hours of a theme park.

Opening hours

Key:

 10am–5pm

 10am–6pm

 10am–7pm

 Closed

JUNE

M	T	W	T	F	S	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

JULY

M	T	W	T	F	S	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

AUGUST

M	T	W	T	F	S	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

SEPTEMBER

M	T	W	T	F	S	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

OCTOBER

M	T	W	T	F	S	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

NOVEMBER

M	T	W	T	F	S	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

(a) What is the date of the last day in the year that the park is open?



.....

1 mark

(b) Sam visits the park on the third Friday in July.

What are the opening hours on that day?



.....

1 mark

(c) How likely is it that the park is open on a day chosen at random in each month?

Put one tick (✓) for each month in the table.



The first is done for you.

	certain	likely	unlikely	impossible
June	✓			
July				
August				
September				
October				
November				

.....

2 marks



10

Write numbers in the boxes to make each of these calculations correct.

(a)  $324 \times 4 = 324 \times 2 \times \boxed{}$

1 mark

(b)  $486 \times 5 = 486 \times 10 \div \boxed{}$

1 mark

(c)  $534 \times 7 = 534 \times 5 + 534 \times \boxed{}$

1 mark

11

On Tuesday, Alex saw 30 people in the park.

17 of the 30 people were children.
 11 of the 17 children were wearing hats.
 There were 5 adults not wearing hats.

Fill in the table to show this information.



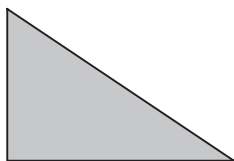
	Wearing hats	Not wearing hats
Adults		
Children		

. . . .

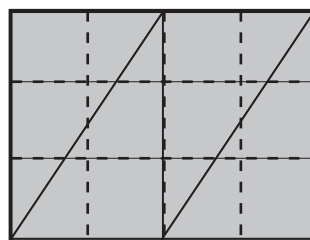
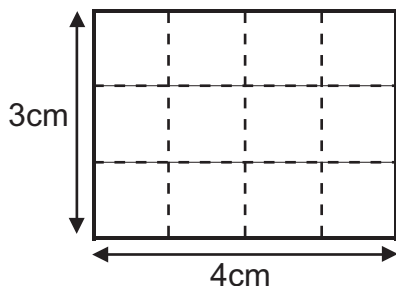
2 marks

13

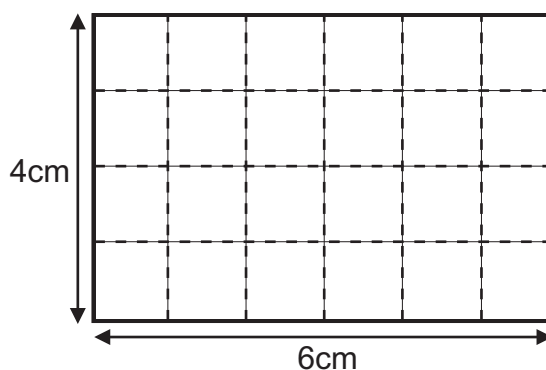
Owen has a lot of right-angled triangle tiles like this.



He can just cover this rectangle with 4 of the triangle tiles.



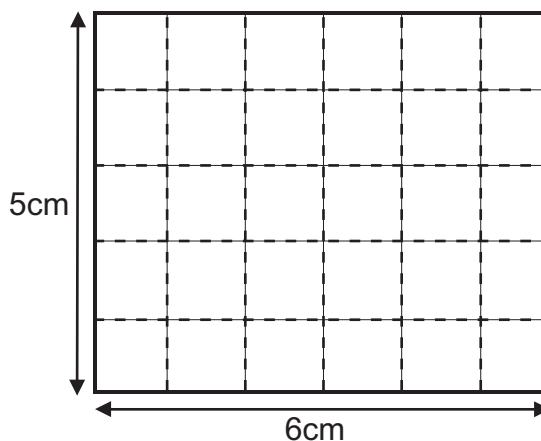
(a) How many triangle tiles does Owen need to just cover this rectangle?



Number of triangle tiles:

1 mark

(b) Show how Owen can just cover this rectangle with his triangle tiles.



1 mark

14

Five pupils picked blackberries.

The table shows the amount that each pupil picked.



Name	Anna	Ben	Colin	David	Ellie
Weight of blackberries	1 kg	1.2 kg	1.6 kg	800g	1.4 kg

- (a) How many kilograms of blackberries did the five pupils pick altogether?



..... kg

.....
1 mark

- (b) The five pupils share out the blackberries equally between themselves.
How many kilograms of blackberries does each pupil get?



..... kg

.....
1 mark

- (c) What is the mean weight of the blackberries that each pupil picked?

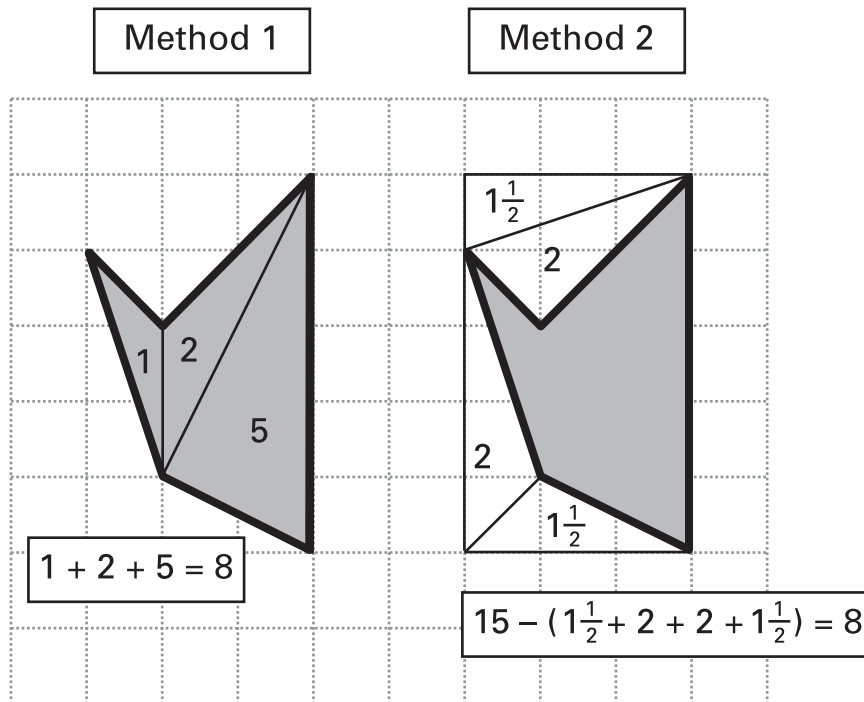


..... kg

.....
1 mark



- 15 Amy uses two different methods to work out the area of this pentagon.



Explain what Amy has done each time.

- (a) Method 1



• • • • •
1 mark

- (b) Method 2



• • • • •
1 mark

16

A roll of steel wire weighs 0.6 tonnes.



A lorry can carry a maximum load of 13 tonnes.



How many rolls of the steel wire can the lorry carry?



.....

.....

.....
2 marks

17

Ethan looks at some information about two towers.

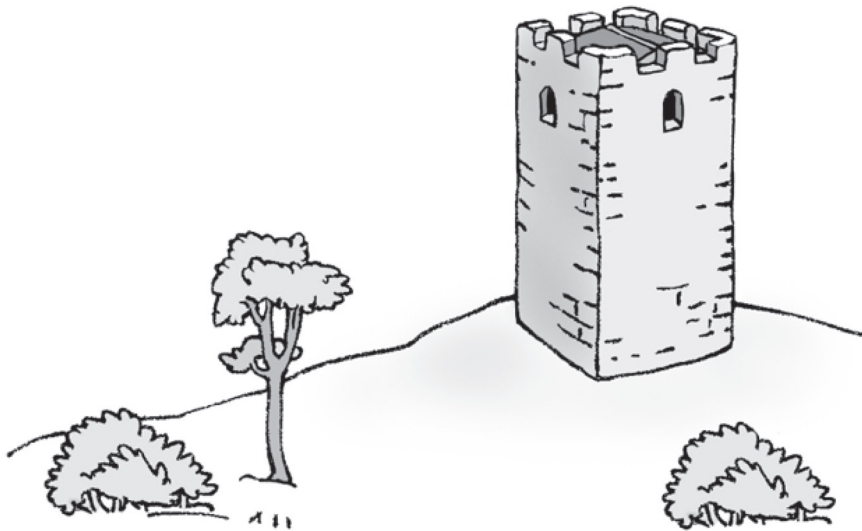
Windy Hill Tower

Number of steps 300

Height 60metres

Castle Tower

Number of steps 150



Ethan says:

Castle Tower is 30 metres high.



Explain why Ethan could be wrong.



1 mark

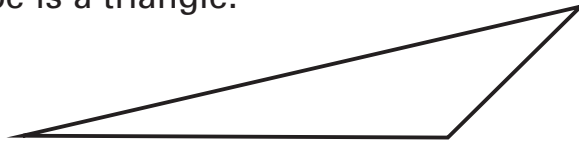
18

Mei has a piece of paper.

She cuts out a shape from her piece of paper.

She folds the shape in half once, and then she folds it in half again.

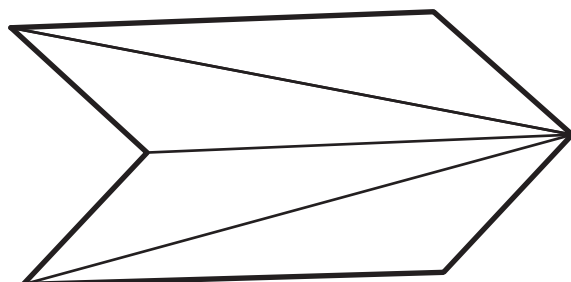
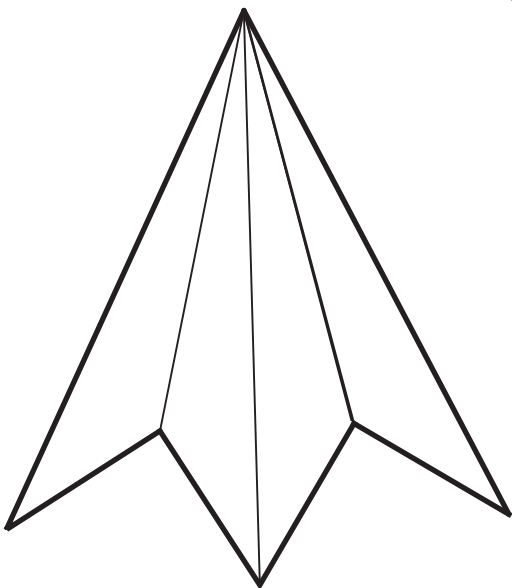
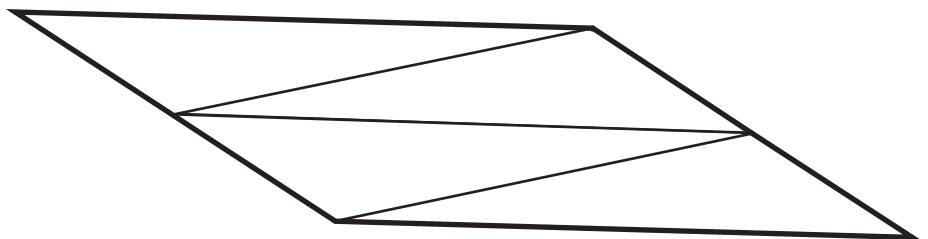
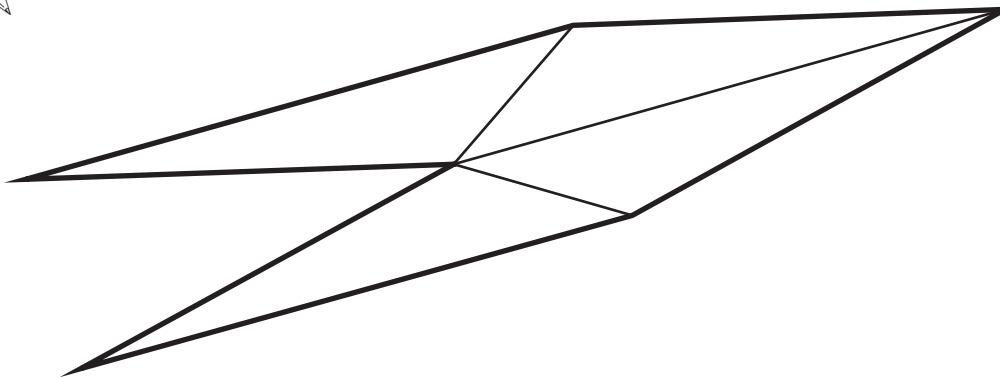
The folded shape is a triangle.



Then Mei unfolds her shape again.

Look at these shapes.

Put a ring around Mei's unfolded shape.



1 mark

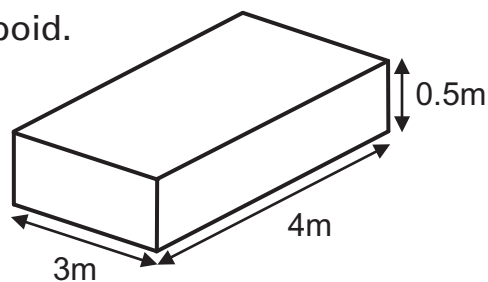


- 19 (a) Jude has a fish pond in the shape of a cuboid.

It is 3m wide, and 4m long.

The water is 0.5m deep.

Calculate the volume of the water in m^3



not drawn to scale



..... m^3

.....
1 mark

- (b)

$1\text{m}^3 = 1000 \text{ litres}$

How many litres of water are there in Jude's pond?



..... litres

.....
1 mark

- (c) The water in the pond has turned green.

Jude buys a bottle of Green Water Treatment.

Look at the instructions.

**Green Water Treatment
Instructions**

Use 10 millilitres of
Green Water Treatment for
every 300 litres of pond water.

How much Green Water Treatment should Jude use for the pond?

Remember to write the units.



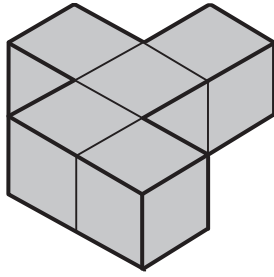
.....
1 mark

.....

.....
1 mark

20

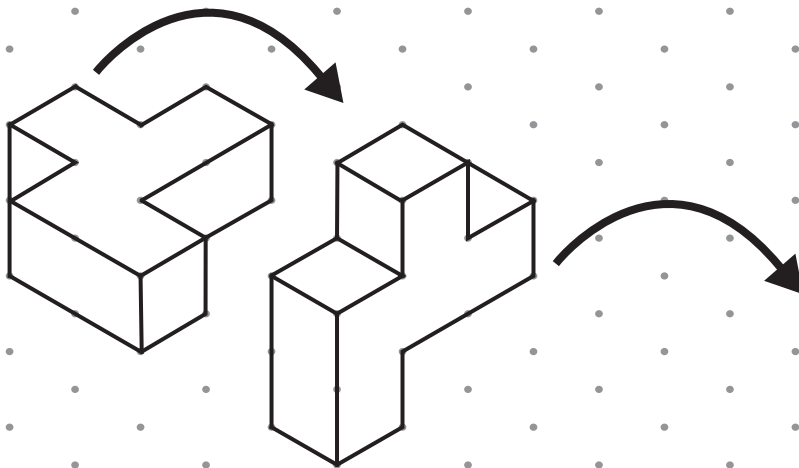
Eve makes a shape with five cubes.



She rotates her shape through a quarter-turn clockwise.

Then she rotates it again through another quarter-turn clockwise.

Draw Eve's shape after the second quarter-turn clockwise.

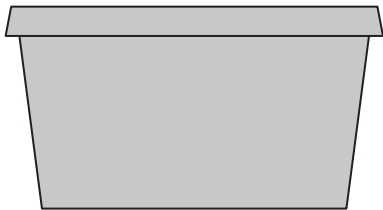
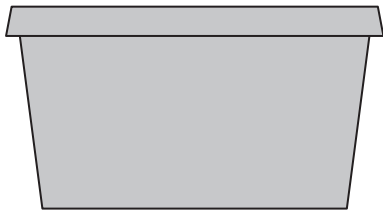


2 marks



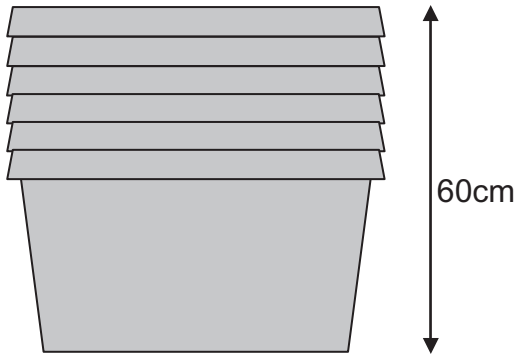
21

These crates can be stacked together.

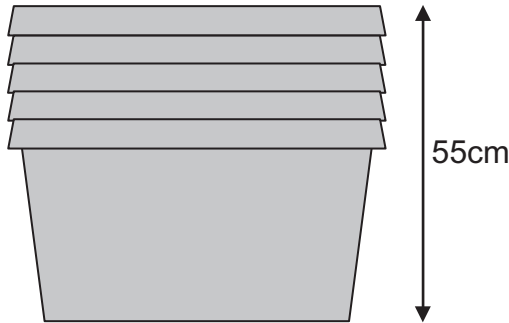


not drawn
to scale

A stack of 6 crates has
a height of 60cm.



A stack of 5 crates has
a height of 55cm.

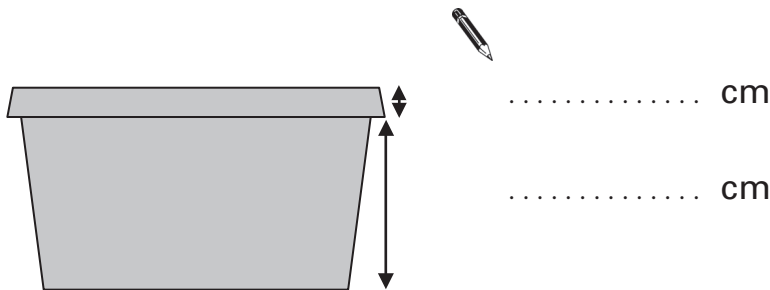


(a) What is the height of a stack of 3 crates?



 cm
1 mark

(b) What are the measurements of one crate?

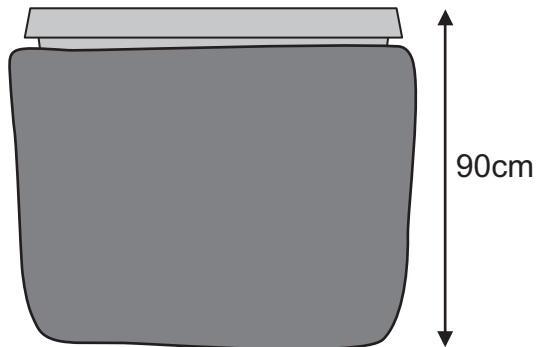


 cm
1 mark

..... cm
1 mark

- (c) A stack of crates has a height of 90cm.

How many crates are there in the stack?



..... crates

.....
1 mark

22

Each number in this sequence is -2 multiplied by the number before.

Write the missing numbers.

.....
1 mark



$-1,$ $2,$ $-4,$, , 32

.....
1 mark



23

Daniel asked the pupils in his class:

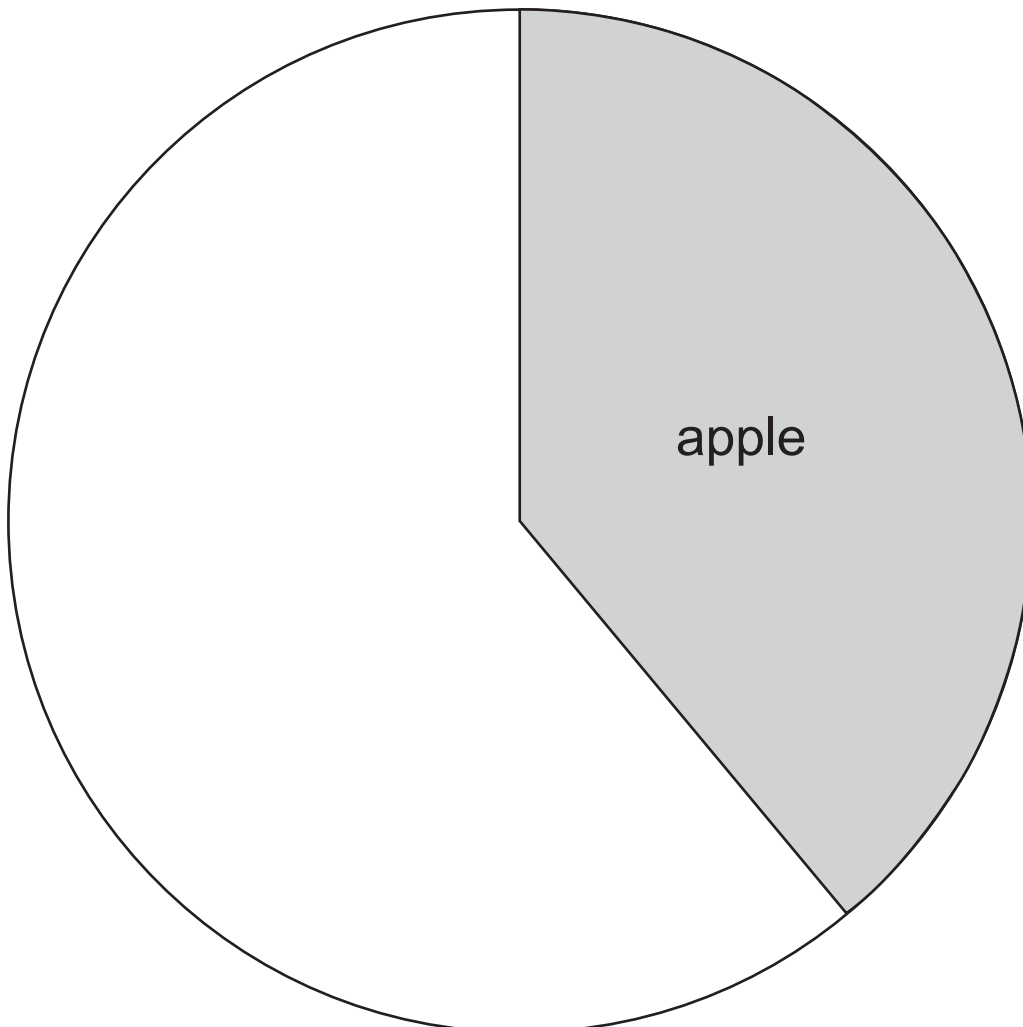
‘Which fruit do you eat most often?’

The table shows his results.

Fruit	Frequency
apple	14
banana	16
other	6

Complete the pie chart.

You will need a ruler and an angle measurer.



.....
.....
.....
3 marks

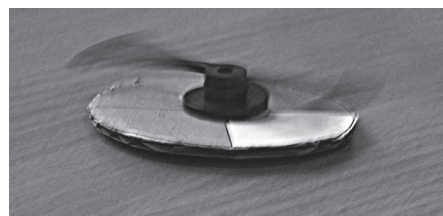
- 24 Draw lines to match the boxes that give the **same** answer.
The first one is done for you.



17×0.1	17×0.25
$17 \div 4$	$17 \div 10$
17×5	$17 \div 5$
$17 \div 0.01$	17×100
17×0.2	$17 \div 0.2$

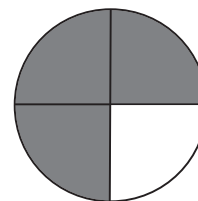
.....
.....
2 marks

- 25 Ada makes a spinner.



The probability that it lands on grey is $\frac{3}{4}$

The probability that it lands on white is $\frac{1}{4}$



Ada spins the spinner 100 times.

How many times would you expect the pointer to land on grey?



.....

.....
1 mark



26

Is it possible to draw these shapes?

Put a tick (✓) for each shape that is possible.

Put a cross (X) for each shape that is not possible.

The first three are done for you.



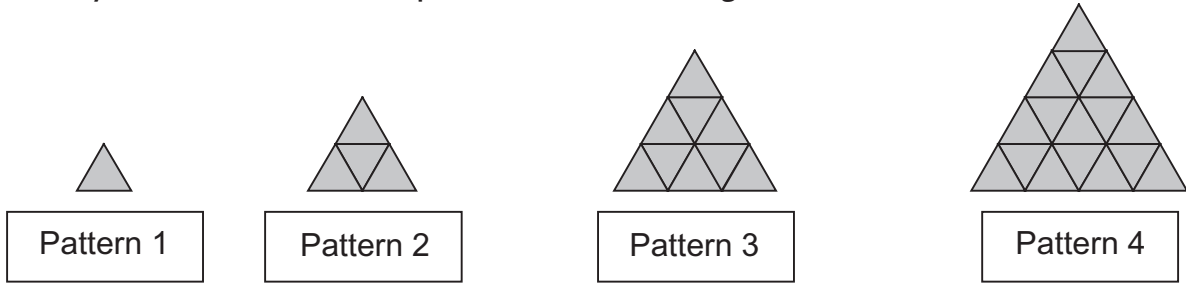
Number of sides	One right angle	Two right angles	Three right angles	Four right angles	Five right angles
4 sides	 ✓	 ✓	X		
5 sides					

. . . .

. . . .
2 marks

27

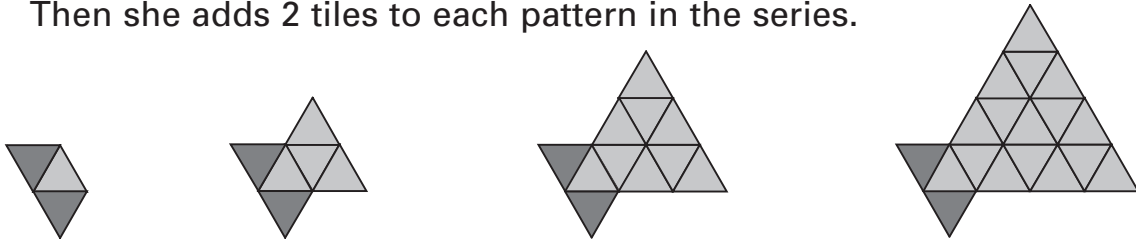
Jay makes a series of patterns with triangle tiles.



Pattern n in Jay's series has n^2 tiles.

Jasmine copies Jay's series.

Then she adds 2 tiles to each pattern in the series.



Write an expression for the number of tiles in Pattern n in Jasmine's series.



.....

1 mark



