THE NORTH LONDON INDEPENDENT GIRLS' SCHOOLS' CONSORTIUM

Group 1

YEAR 7
ENTRANCE EXAMINATION

MATHEMATICS

Friday 17 January 2014

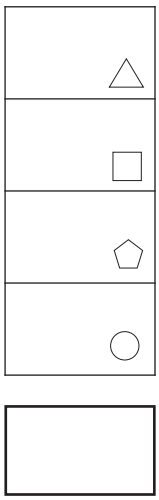
Time allowed: 1 hour 15 minutes

First Name: .....

Surname: .....

Instructions:

- Please write in pencil.
- Please try **all** the questions.
  If you cannot answer a question, go on to the next one.
- Do your rough working in the space near each question.
  Do not rub out your working as you may get marks for it.
- Calculators and rulers are NOT allowed.



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1. Work out 2495 + 609

Answer: .....

2. Work out 2495 − 609

Answer: .....

3. Work out 7083 × 6

Answer: .....

4. Work out 7083 ÷ 9

Answer: .....

5. (a) Which number is 1000 times bigger than 34.2?

Answer: .....

(b) Which number is *one hundred* less than *two thousand and forty*?

Answer: .....

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6. Which number between 50 and 75 is a multiple of both 3 and 7?

Answer: .....

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7. Work out $\frac{3}{4}$ of 72

Answer: .....

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8. Write a number in the box to complete the number sequence below:

112 **56** ☐ **14**

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9. Circle the three numbers in the list below which have a sum of 12 and a product of 42

2 **3** **4** **5** **6** **7** **8** **9**



10. Write these numbers in order of size, starting with the smallest:

3.808 **3.8** **3.88** **3.08**

Answer: ....., ..., ..., ...

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11. Write a number in each box in order to make the calculations correct.

(a) $23 \times \square = 50 - 4$

(b) $13 = \square + (5 - 2)^2$

(c) $72 \div \square = 17 - 15 + 6$

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12. (a) Paula was given £40 for her birthday.
She used some of this money to buy a scarf for £14.95 and a hat for £8.45
How much of her birthday money does she have left?

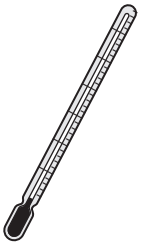
Answer: £.....

(b) Sarah has 6 coins in her pocket, which come to a total of £1.75
Which coins could Sarah have in her pocket?
Give two possible answers.

Answer: ....., ..., ..., ..., ..., ...,

or: ....., ..., ..., ..., ..., ...,

13. The table below shows the temperatures in three towns on Monday.



town	temperature, in °C
Sumville	8
Addington	-11
Totalford	-6

(a) How many degrees warmer was it in Sumville than in Addington?

Answer: ..... degrees

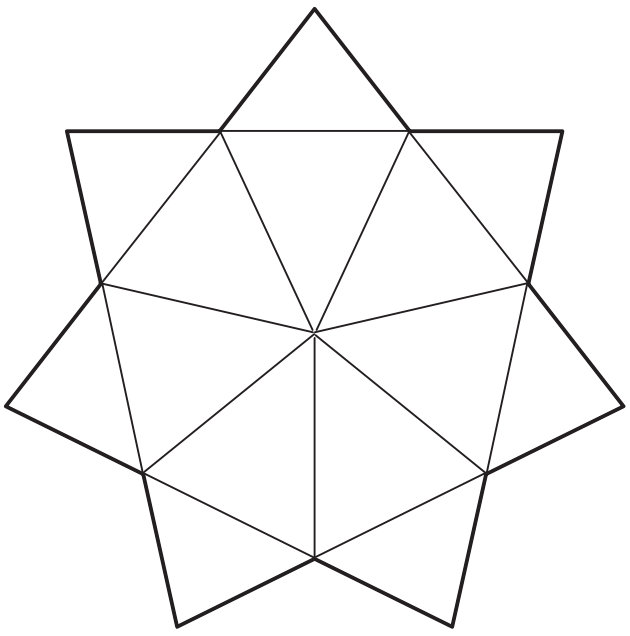
By Tuesday, the temperature in Totalford was 7 degrees colder than on Monday.

(b) What was the temperature in Totalford on Tuesday?

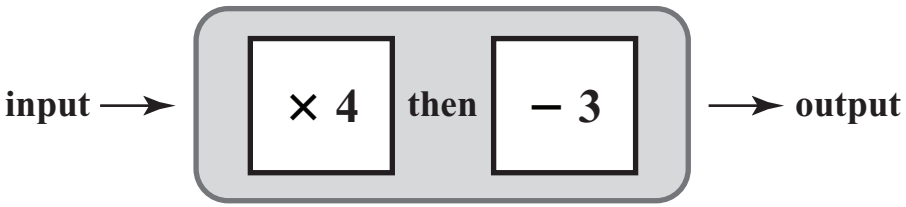
Answer: ..... °C

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14. Shade $\frac{3}{7}$ of the shape below.



15. (a) Sally has the number machine shown below.



Complete the table of input and output numbers for Sally's machine.

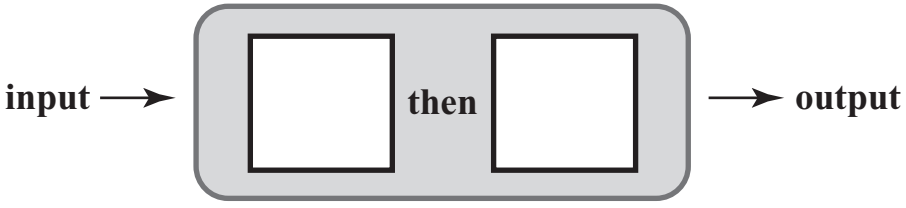
input	output
2	5
6	
	33
	-1

(b) Imogen has a different number machine which produced the following table of input and output numbers.

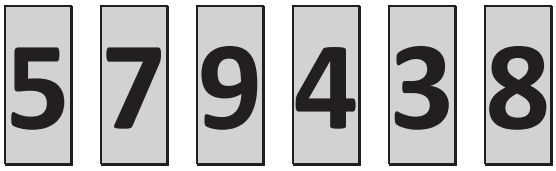
input	output
-1	0
0	2
1	4
2	6

Unfortunately, the labels have fallen off Imogen's machine.

Write suitable labels on the diagram below.

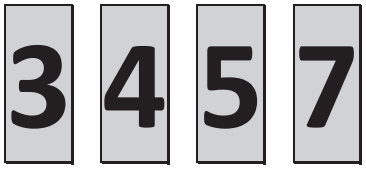


16. Charlotte has the six number cards shown below.



The cards can be placed together to form a number.

For example, using just 4 cards, the smallest 4-digit number which can be made is 3457



(a) Using all six cards, what is the largest even number which can be made?

Answer: .....

(b) Using any number of the cards, what is the number closest to 5000 which can be made?

Answer: .....

(c) What is the largest 3-digit multiple of 5 which can be made?

Answer: .....

(d) Write down the largest 4-digit multiple of 4 which can be made.

Answer: .....

17. The school concert starts at 2:45 p.m.

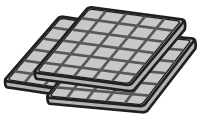
It lasts for 2 hours and 28 minutes and, in addition, there is an interval of 20 minutes.

At what time does the concert end?

Answer: ..... p.m.

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18. Helen's recipe for 12 waffles needs the following ingredients:



250 grams plain flour
2 tablespoons caster sugar
2 eggs
1 teaspoon baking powder
420 millilitres milk

(a) What mass of plain flour does Helen need to use in order to make 18 waffles?

Answer: ..... g

Helen has only 5 eggs. She has plenty of all the other ingredients.

(b) What is the largest number of waffles which Helen can make if she has only 5 eggs?

Answer: .....

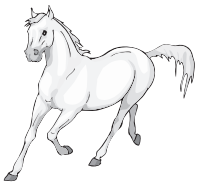
Katy has a different recipe for making 12 waffles.

Her recipe requires 13 ounces of plain flour.

(c) Given that **1 ounce is approximately equal to 25 grams**, work out how much more flour in grams is required for Katy's recipe.

Answer: ..... g

19. Jasper the horse eats three quarters of a bale of hay every day.



(a) How many bales of hay does Jasper eat in 8 days?

Answer: .....

(b) How many days does it take Jasper to eat 27 bales of hay?

Answer: .....

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20. Summer has correctly used her calculator to work out that

17 × 538 = 9146

Without doing any long multiplication or division, use Summer's calculation to work out

(a) 17 × 540

Answer: .....

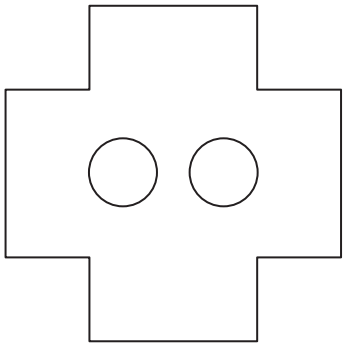
(b) 27 × 538

Answer: .....

(c) 9146 ÷ 34

Answer: .....

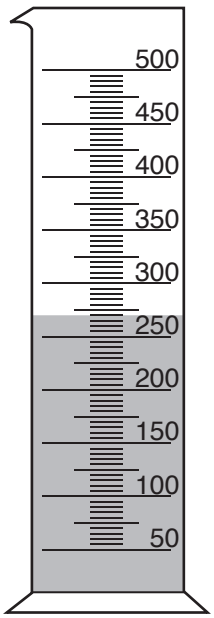
21. (a) Draw all the lines of symmetry on the shape below.



(b) Reflect the word SOW in the dashed line.

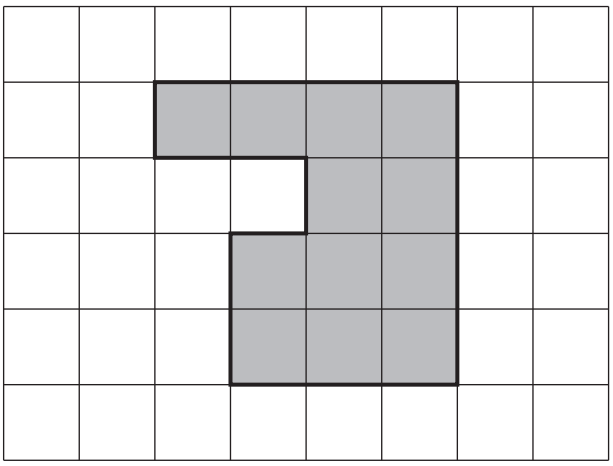
S O W

(c) How many millilitres of liquid are in this container?



Answer: ..... ml

22. Shape D is drawn on centimetre-squared paper below.



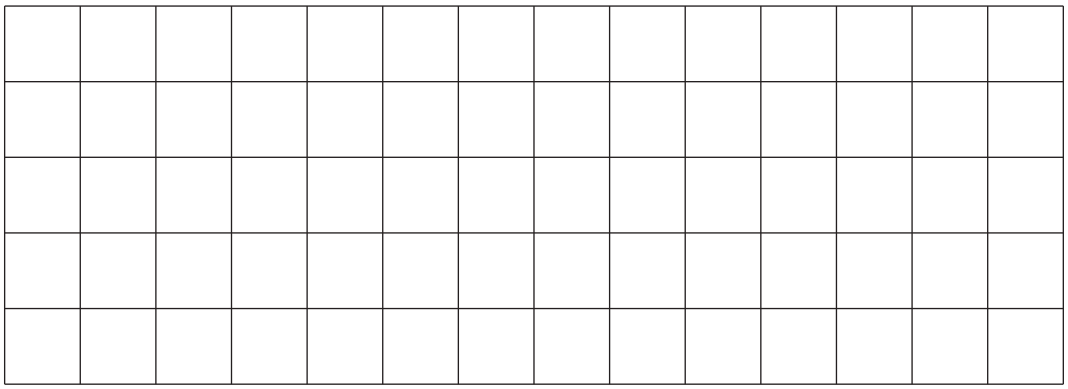
(a) Write down the area of shape D.

Answer: ..... cm^2

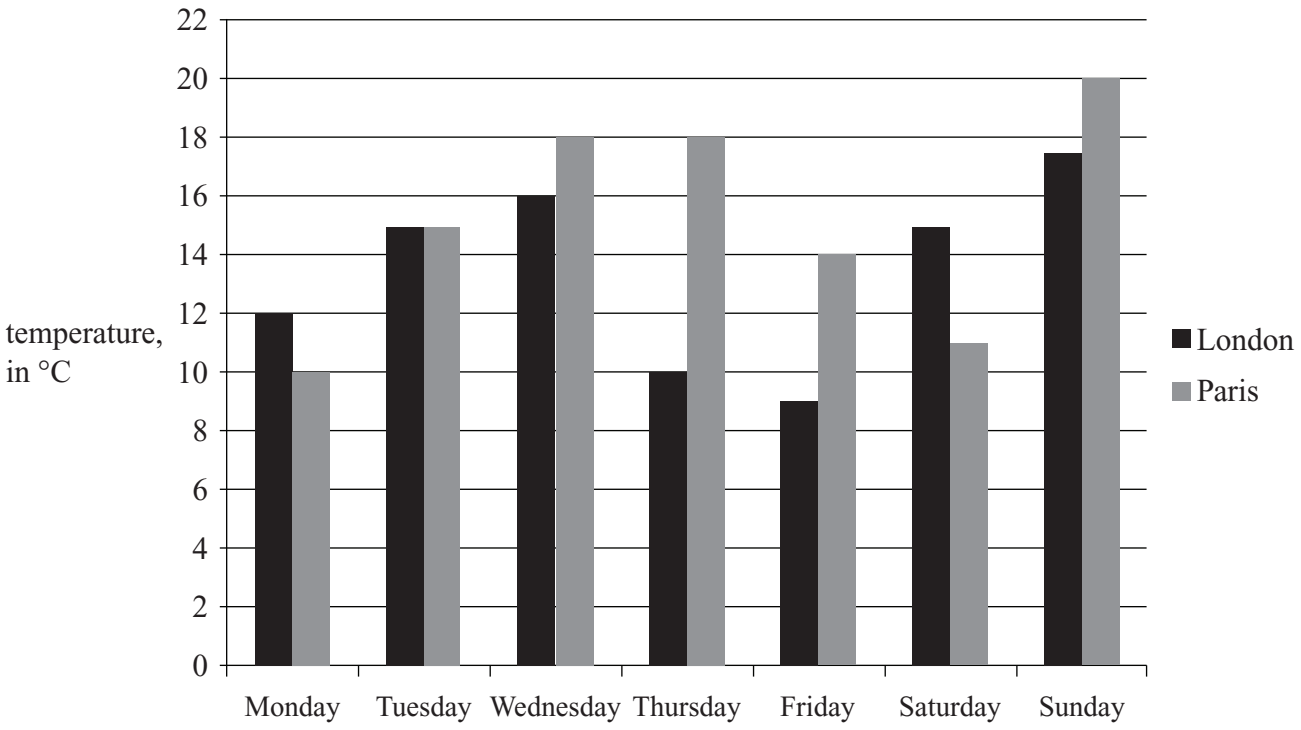
(b) What is the perimeter of shape D?

Answer: ..... cm

(c) Draw a rectangle which has the same area as shape D on the centimetre-squared grid below.



23. (a) The bar chart below shows the midday temperatures each day in London and Paris during the same week one spring.



(i) What was the temperature in Paris at midday on Friday?

Answer: ..... °C

(ii) What was the lowest temperature at midday that week in London?

Answer: ..... °C

(iii) How many degrees colder was it in Paris on Saturday than on Thursday?

Answer: ..... degrees

(iv) On which day was there the greatest difference between the temperatures in London and Paris, and by how many degrees?

Answer: ..... by ..... degrees

(b) The temperatures at midday in Edinburgh during the same week were:

6 °C **10 °C** **10 °C** **9 °C** **6 °C** **5 °C** **10 °C**

For these temperatures, work out

(i) the range

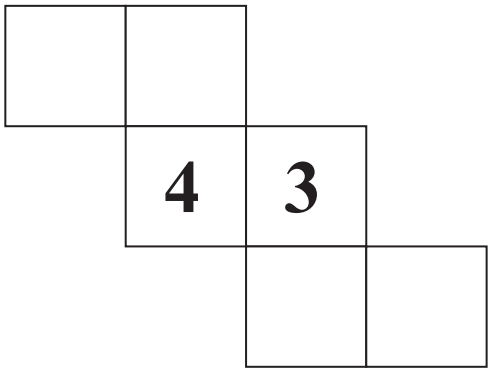
Answer: ..... °C

(ii) the mean (average) temperature

Answer: ..... °C

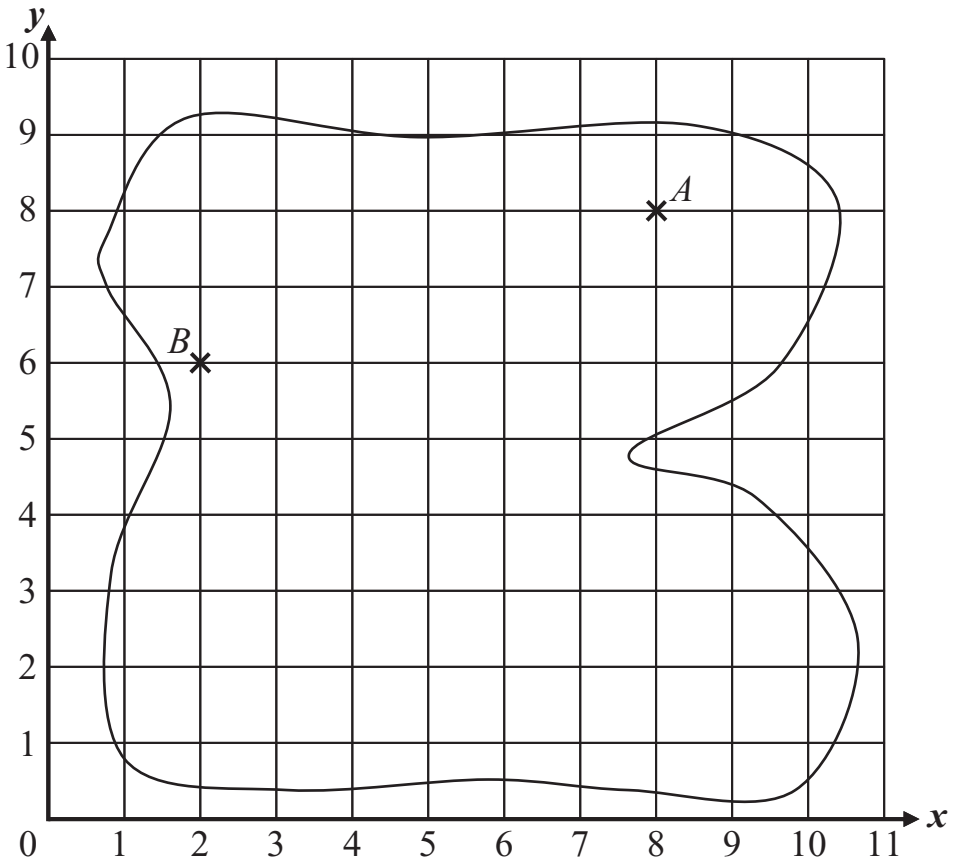
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24. Write the numbers from 1 to 6 on the net below, so that when it is folded to make a cube, the sums of the numbers on opposite faces are 6, 7 and 8



The numbers 3 and 4 have already been placed for you.

25. The diagram below shows a map of a treasure island.



(a) Write down the coordinates of the point *B*.

Answer: (..... , ...)

(b) Plot the point with coordinates (8, 0) and label it *C*.

(c) Seema has found some clues which describe the position of some treasure.

If you walk in a straight line from *C* to *A*, the gold coins are hidden exactly ¼ of the distance from *C* to *A*.

The silver crown is at the midpoint of the straight line from *A* to *B*.

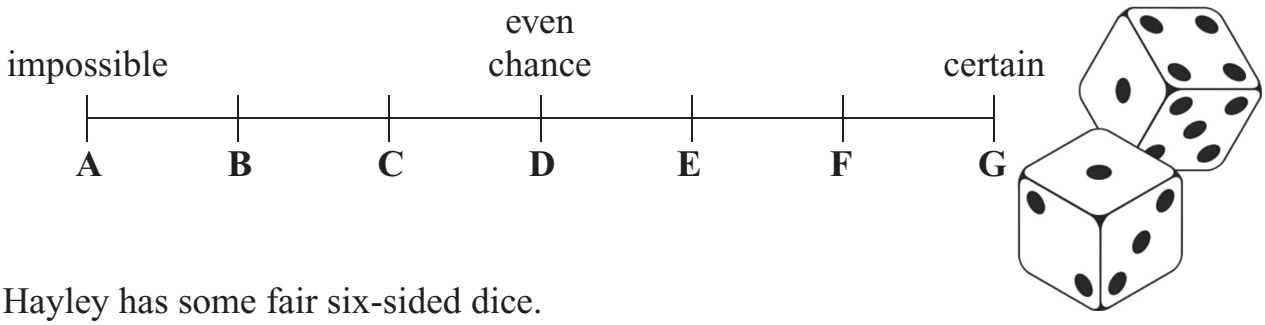
(i) Write down the coordinates of the gold coins.

Answer: (..... , ...)

(ii) Write down the coordinates of the silver crown.

Answer: (..... , ...)

26.



Hayley has some fair six-sided dice.

She chooses one die and rolls it.

Write down the letter on the scale above which represents the probability that the face showing will be

(a) a 4

Answer: .....

(b) less than 5

Answer: .....

(c) a prime number

Answer: .....

27. Ella has been asked to sort some shapes into the correct positions in the table below. She has already filled in one shape.

	all sides equal length	not all sides equal length
at least one pair of parallel sides	square	
no parallel sides		

Write the following 5 shapes in the correct boxes in the table:

trapezium **isosceles triangle** **rhombus**

regular hexagon **regular pentagon**

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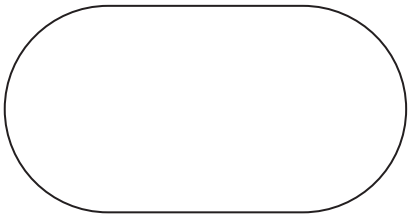
28. Imagine a cube with each side 5 cm.

If a 1-cm cube is cut from each corner, how many faces will the new shape have?

Answer: .....

29. A running track has a perimeter of 400 metres.

Roger trains every morning by running around the running track until he has run a distance of 6 kilometres.



(a) How many times around the track does Roger run each morning?

Answer: .....

(b) A marathon course is 42.2 km long.

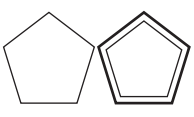
One marathon begins with 13.4 km running along country roads.

The runners then complete 2 laps of equal length through a town.

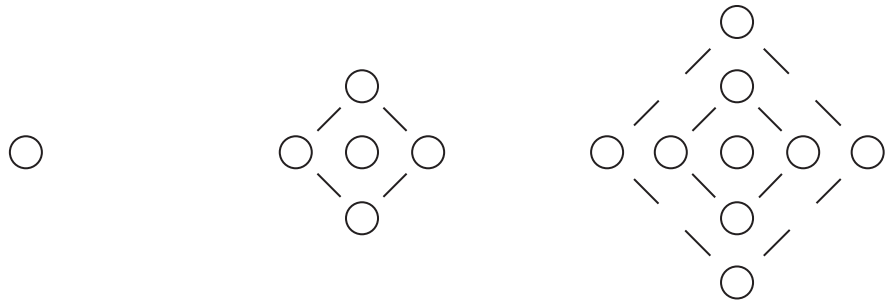
To complete the race, the runners run around the running track 3 times.

Work out the length of a lap through the town.

Answer: ..... km

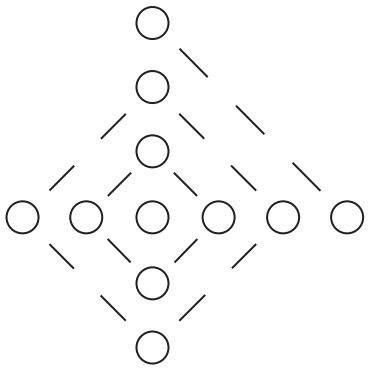


30. Here is a pattern made with circles and lines:



pattern 1 pattern 2 pattern 3

(a) Complete pattern 4 in the space below.



(b) Complete the table showing the number of circles and lines in each pattern.

pattern number	1	2	3	4
number of circles	1	5		13
number of lines	0		12	

(c) How many circles are there in pattern 6?

Answer: .....

(d) How many lines has pattern 5?

Answer: .....

(e) Which pattern has 37 circles?

Answer: pattern .....

(f) Emily says there are 100 circles in one of the patterns.
Explain why Emily is not correct. You must give a clear reason.

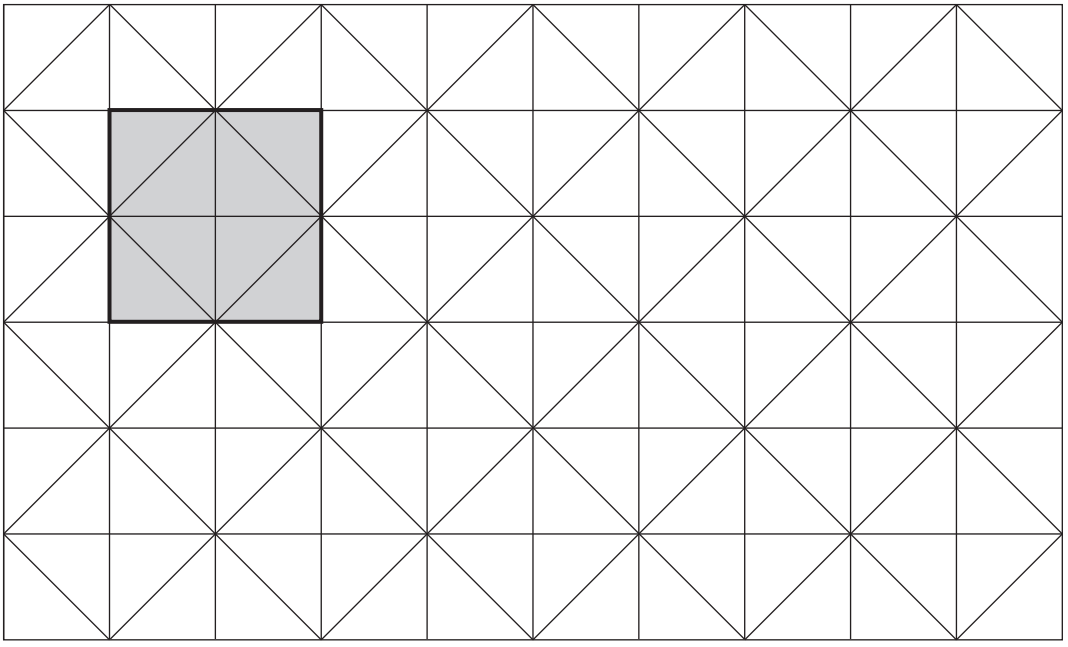
Answer: .....

.....

.....

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31. The shaded square below has an area of 8 cm^2.



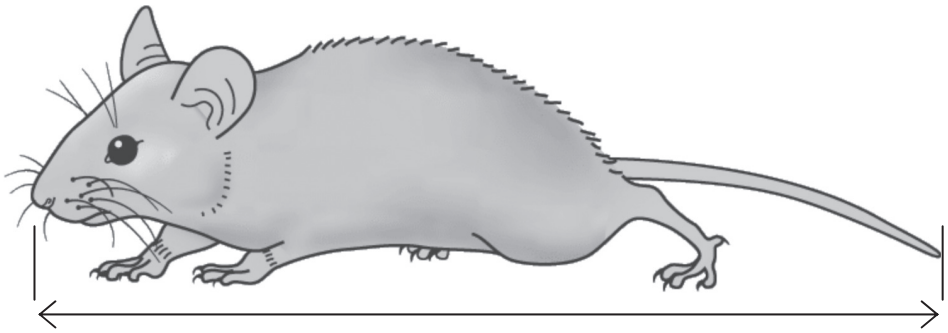
On the grid above, shade

(a) a square with area 4 cm^2

(b) a triangle with area 8 cm^2

(c) a triangle with area 9 cm^2

32. Morag has a pet mouse, Squeak, shown in the life-size picture below.



(a) Estimate the length of Squeak, from the tip of his nose to the tip of his tail.

Answer: ..... cm

A 280 g packet of mouse food will feed Squeak for 8 weeks.

(b) What mass of food does Squeak eat each week?

Answer: ..... g

A 280 g packet of mouse food costs £2.50

(c) Work out the cost of feeding Squeak for 2 years.

Answer: £ .....

Squeak 'squeaks' once every 15 seconds.

He squeaks once at 07:30

(d) How many times will Squeak 'squeak' between 07:30 when Morag gets up, and 21:30 when she goes to bed?

Give your answer to the nearest 500

Answer: .....

33. The diagram below shows a pattern of numbers.

23	34	11
31		56
8	53	45

(a) Write down the sum of the numbers on the

(i) grey squares

Answer: .....

(ii) white squares

Answer: .....

(b) What is the relationship between the numbers on a grey square and the numbers on the two white squares on either side?

Answer: .....

In these patterns, the sum of the numbers on the opposite grey squares is known as the **hoop number**.

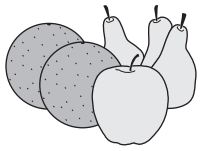
In the example above, the hoop number is 87

(c) For the example below, the **hoop number** is 133

Use this information to complete the diagram.

35		19
61		

34. (a) An apple, 2 oranges and 3 pears cost £2.10 altogether.
An orange and a pear cost 64 pence.



How much more does an apple cost than an orange?

Answer: ..... p

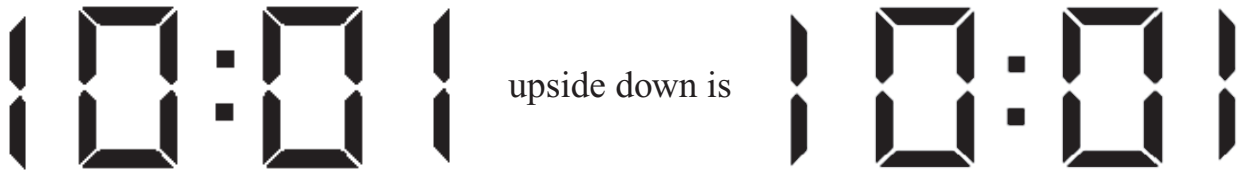
(b) Mike has 27 vehicles to service at his garage.
Some are cars (4 wheels) and the rest are motorcycles (2 wheels).
Altogether, the 27 vehicles have 78 wheels.

How many cars does Mike have to service?

Answer: .....

35. Janice realises that there are many times when, if you look at a digital clock upside down, the display will show the same time.

For example,



List all of the times, using the 24-hour clock, which show the same time when read upside down.

The numbers below may help.



Answer: .....

.....

.....

.....

.....

36. Miss Drew is arranging the cast for the school nativity play.

There are 6 children and 6 characters – Mary, Joseph, Herod, a shepherd, the innkeeper and an angel.

If possible, Miss Drew must give each child his or her first choice but, if this is not possible, his or her second choice.

The table below shows each child's first and second choices.

child	first choice	second choice
Sally	Mary	innkeeper
Gemma	shepherd	angel
Tom	Joseph	innkeeper
Jon	Joseph	Herod
Clare	Mary	shepherd
Peter	Herod	Joseph

Work out who should play each character so that as many children as possible are pleased.

Answer: Mary .....

Joseph .....

Herod .....

shepherd .....

angel .....

innkeeper .....

(Total: 100 marks)