THE NORTH LONDON INDEPENDENT GIRLS' SCHOOLS' CONSORTIUM

Group 2

YEAR 7
ENTRANCE EXAMINATION

MATHEMATICS

Friday 8 January 2016

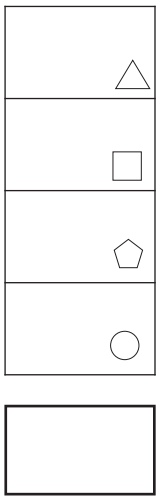
Time allowed: 1 hour 15 minutes

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 $2015 + 329$

Answer: .....

---

2. Work out $2015 - 329$

Answer: .....

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3. Work out 2898×9

Answer: .....

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4. Work out $2898 \div 6$

Answer: .....

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5. Work out $\frac{5}{7}$ of 84

Answer: .....

6. Write down the next two numbers in the sequence.

5, 11, 23, 47, ☐, ☐

---

7. Write a number in each box to complete the statements.

(a) $16.7 \times 1000 =$ ☐

(b) ☐ $\div 100 = 3.7$

---

8. Which number is *one hundred* less than *three thousand and sixteen*?

Answer: .....

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9. Write the missing sign ($=$, $<$ or $>$) in the box.

19×3 ☐ 28×2



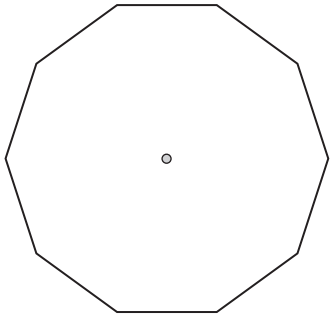
10. The temperature inside Nanook's igloo is 9 °C and the temperature outside is -12 °C.

How many degrees warmer is it inside than outside?

Answer: ..... degrees

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11. Draw lines from the centre to help you shade 20% of this shape.



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12. Sherry's train to Bristol was scheduled to leave at 13:40 and to arrive at 14:20
However, the train left eight minutes late and then took 47 minutes.

At what time did Sherry arrive?

Answer: .....

---

13. Which number between 60 and 80 is a multiple of both 3 and 8?

Answer: .....

---

14. Lisa thinks of her favourite number.
She multiplies her favourite number by 2, subtracts 3 and gets 19

What is Lisa's favourite number?

Answer: .....

15. (a) Daniel and Bella are playing a game.

When Daniel calls out a number, Bella multiplies it by 3 and then subtracts 5 and writes down the result.

For example, when Daniel calls out 2, Bella writes down 1

They record the numbers in a table.

Complete the table below.

Daniel calls out	Bella writes down
5	
	19
	-2

(b) Claire and Erin play a similar game.

They record their results in the table below.

Claire calls out	Erin writes down
-1	1
0	4
1	7
2	10

Work out what Erin does to each number that Claire calls out.

Answer: Erin multiplies by ..... and then adds .....

16. Cameron has five number cards.



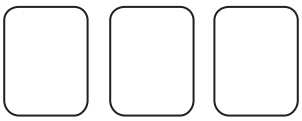
The cards can be placed together to form a number.

For example, using three of his cards Cameron can create the smallest 3-digit multiple of 3

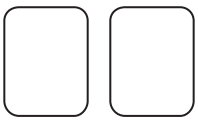


In the questions that follow, *choosing from Cameron's cards*, write numbers on the blank cards to make:

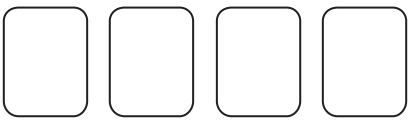
(a) the *smallest* possible 3-digit multiple of 6



(b) the *largest* possible 2-digit prime number



(c) the *largest* possible 4-digit multiple of 5



17. The information on a pack of '*Salmon pasta*' is shown in the table.

NUTRITION per 100 g	
Protein	**10 g**
Carbohydrate	**15 g**
Fat	**5 g**
Fibre	**2 g**
Salt	**0.5 g**

(a) How many grams of protein are in 100 g of '*Salmon pasta*'?

Answer: ..... g

(b) What percentage of the '*Salmon pasta*' is carbohydrate?

Answer: ..... %

The mass of the fibre in a pack of '*Salmon pasta*' is 7 grams.

(c) What is the mass of '*Salmon pasta*' in the whole pack?

Answer: ..... g

(d) What will be the mass of fat in a pack of '*Salmon pasta*'?

Answer: ..... g

18. Mrs King asked all the children in Year 6 if they play tennis.

This table shows some of the results.

	play tennis	do not play tennis	total
Class 6A	13		23
Class 6B		15	
total		25	48

(a) How many children are there in class 6B?

Answer: .....

(b) Complete the table.

(c) What fraction of the children who do not play tennis are in class 6B?

Answer: .....

---

19. It is known that $425 \times 134 = 56\,950$

Use this calculation to work out

(a) 4.25×1.34

Answer: .....

(b) $56\,950 \div 4.25$

Answer: .....

(c) 42.5×67

Answer: .....

20. In a magic square, the sum of the numbers in each row, each column and each diagonal is the same.

Write numbers in the pale grey squares to complete this magic square.

	3	2	
5	10	11	8
9	6		12
4			1

---

21. Barbara buys a box containing a selection of three types of biscuit.

There are eight chocolate biscuits.

A third of the other biscuits are custard creams.

There are twelve ginger biscuits.

(a) How many custard creams are there?

Answer: .....

(b) How many biscuits are in the box?

Answer: .....

---

22. In a box of shapes there are three times as many squares as there are circles.

There are twice as many triangles as squares.

If there are 45 squares, how many shapes are there altogether?

Answer: .....

23. Which bus takes the shortest time from Elgin to Inverness and by how many minutes?

	Bus P	Bus Q
Elgin	11.47 a.m.	12.33 p.m.
Inverness	1.06 p.m.	1.50 p.m.

Answer: Bus..... by ..... minutes

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24. Janet's marks on five mental arithmetic tests are:

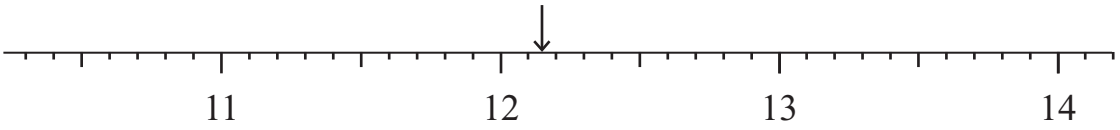
15 19 13 18 20

What is her mean (average) mark?

Answer: .....

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25. What number is indicated by the arrow on the scale?



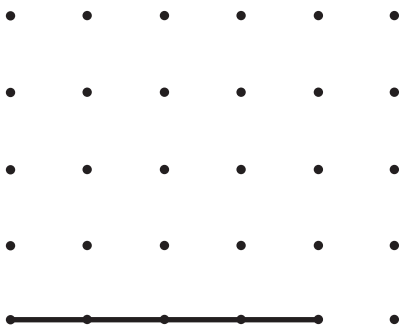
Answer: .....

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26. A parallelogram has area 12 cm^2 and all its vertices (corners) lie on the dots of the centimetre square dotted grid.

One side of the parallelogram, which is ***not*** a rectangle, is drawn for you.

Complete the drawing of the parallelogram.

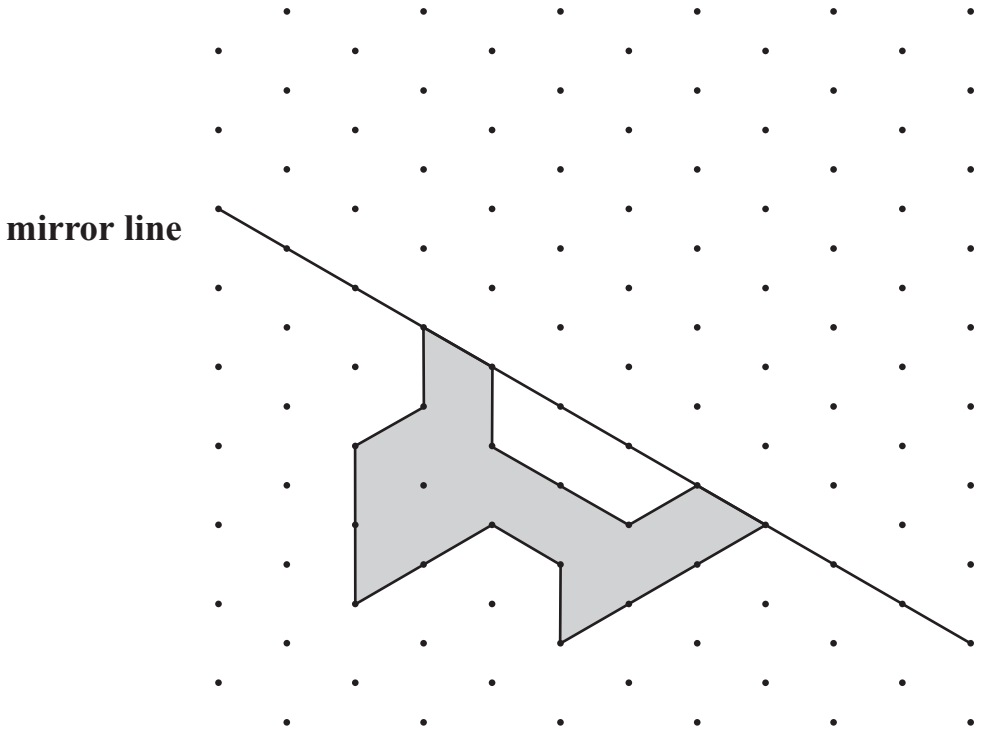


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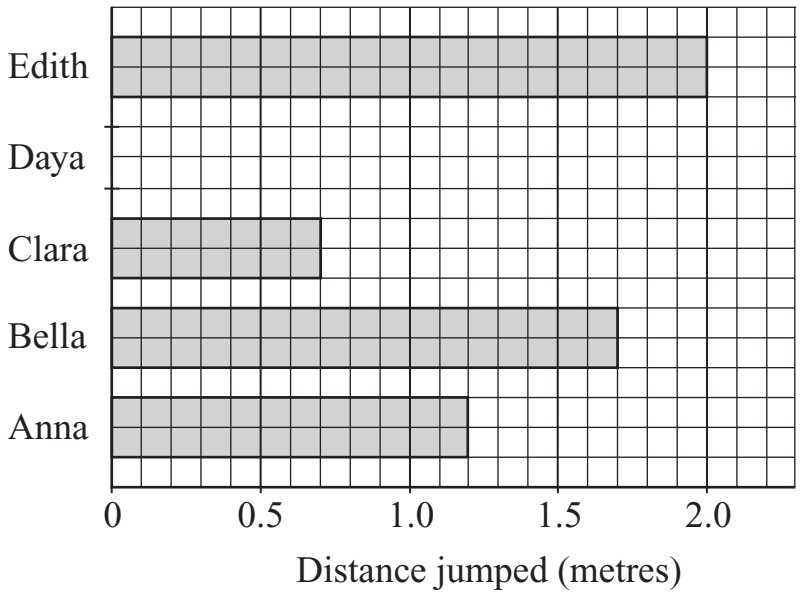
27. Which is more likely, rolling a 3 with an unbiased die with six faces, or getting a head with a fair coin?

Answer: .....

28. Reflect the shaded shape in the mirror line.



29. In the long jump competition, children recorded their results in a bar chart:



(a) Daya jumped 1.5 m.

Draw the bar to represent Daya's jump.

(b) By how many **centimetres** did Anna beat Clara?

Answer: ..... cm

30. Penny places 10p coins, touching, in a straight line.

She hopes to make a line of coins that measures 1 km.

A 10p coin has a diameter of 25 mm.

(a) How long, in metres, is a line of forty 10p coins?

Answer: ..... m

(b) What is the total value, in pounds, of forty 10p coins?

Answer: £ .....

(c) How many coins will Penny need for a 1 kilometre line of 10p coins?

Answer: .....

(d) What is the total value of a 1 kilometre line of 10p coins?

Answer: £ .....

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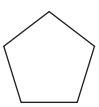
31. Joanna was born on 19 August 2004 and her mother, Wendy, was born on the same date 26 years earlier.

(a) What is Joanna's age, ***on 1st January***, in 2016?

Answer: ..... years

(b) In which year, ***on 1st January***, will Wendy's age be three times Joanna's age?

Answer: .....



32. Six girls took a maths test.

Their marks were **13** **18** **14** **20** **7** **18**

(a) What is the difference between the highest and lowest marks?

Answer: .....

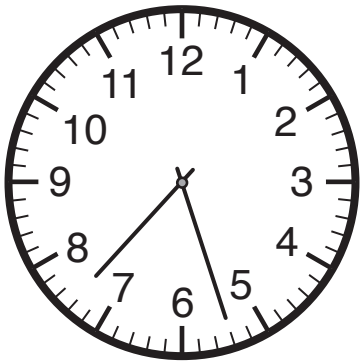
Ashleigh's mark was seven more than Bella's mark and six less than Connie's mark.

(b) What was Ashleigh's mark?

Answer: .....

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33. Amira checks the time when she sets off on her journey to school in the morning.



(a) Write the time as a 12-hour time.

Answer: ..... a.m.

At twenty minutes to eight, Amira stops to buy an apple from the shop.

(b) Write 'twenty minutes to eight' as a 12-hour clock time.

Answer: ..... a.m.

Amira spends five minutes at the shop before walking another twenty-three minutes to get to school.

(c) At what time does Amira reach school?

Answer: ..... a.m.

34. The diagram below shows information about the girls in Year 6 who play in the hockey team and/or the netball team.

	hockey	not hockey
netball	9	6
not netball	7	3

(a) How many girls are in Year 6?

Answer: .....

(b) How many of the girls play in both teams?

Answer: .....

(c) What percentage of the girls play in the hockey team but not in the netball team?

Answer: ..... %

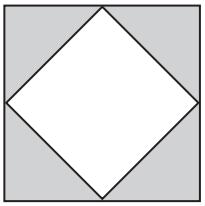
(d) What fraction of the girls who play netball also play hockey?

Answer: .....

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35. The diagram shows two squares. The larger square has perimeter 16 cm.

not to scale

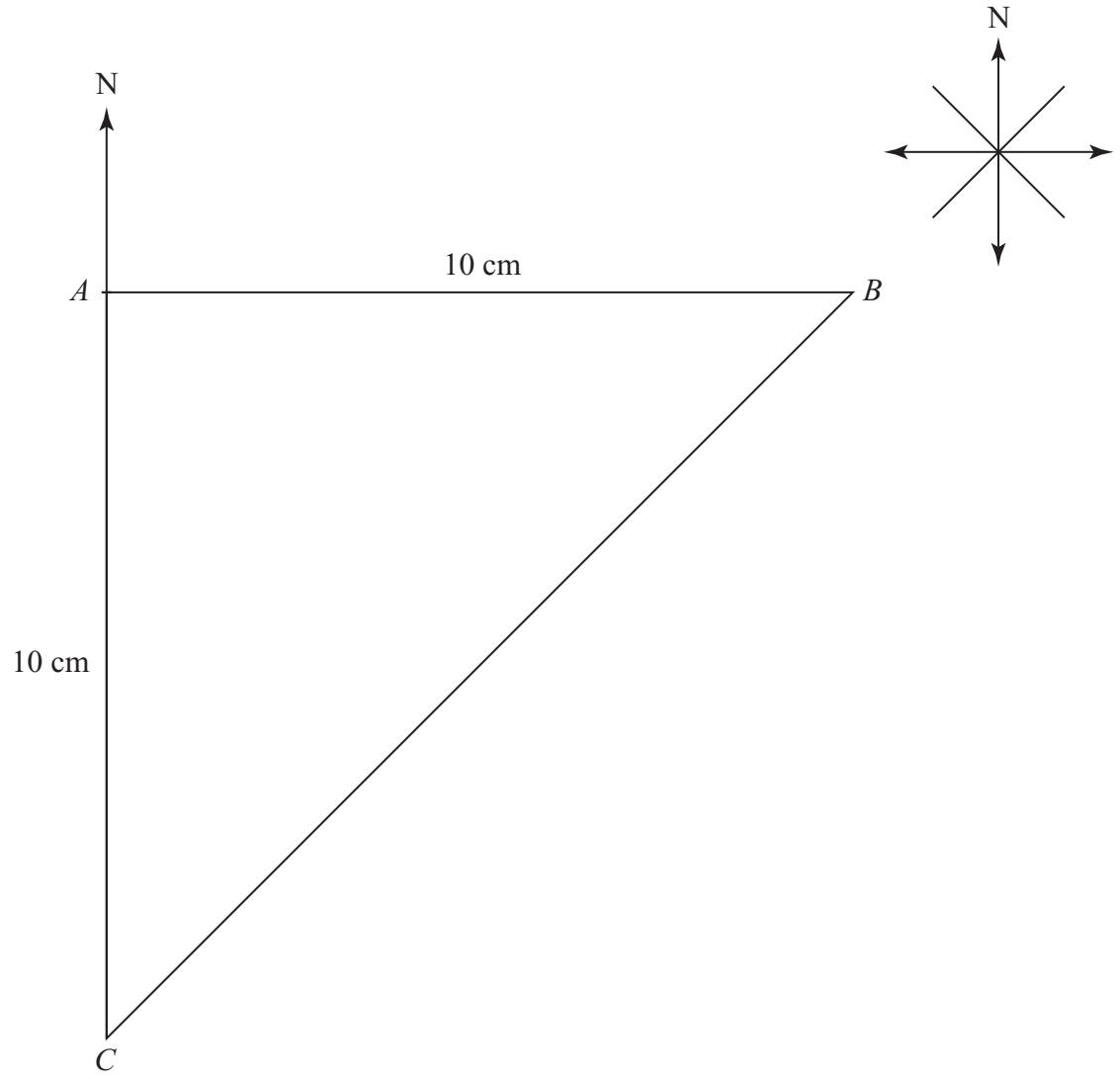


What is the ***area*** of the smaller, white square?

Answer: ..... cm^2

36. Bertie the Bee flies in straight lines from *A*, 10 cm to *B* and then from *B* to *C* which is 10 cm due south of *A*.

Below is an accurate diagram of Bertie's route.



(a) On the list below, circle the direction that Bertie flies to get from *B* to *C*.

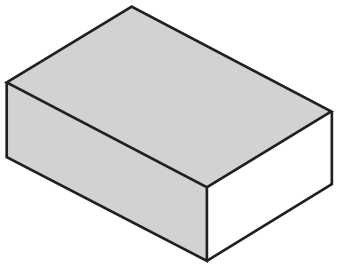
north-east south-west north-west south-east

Bertie then flies from *C* back to *A*.

(b) *Estimate* the total distance that Bertie flies.

Answer: ..... cm

37. A matchbox measures 1 cm high, 3 cm wide and 5 cm long.



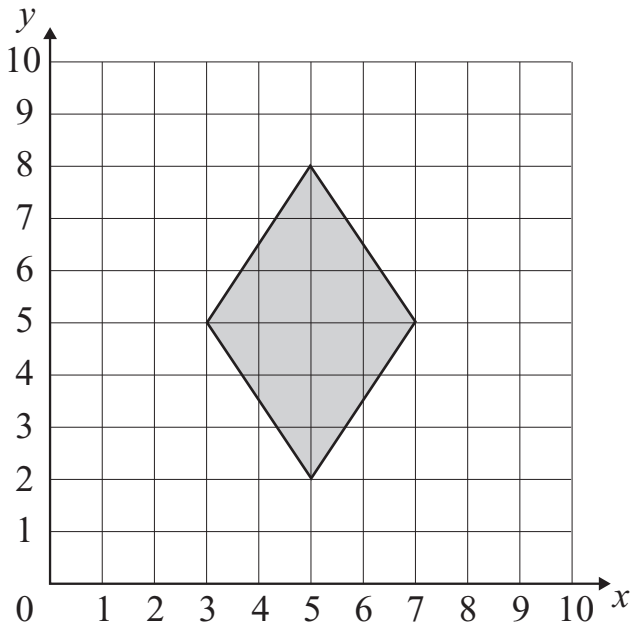
(a) What is the **maximum** number of matchboxes that could fit, in one layer, onto a tray that is 20 cm long and 15 cm wide?

Answer: .....

(b) What is the maximum number of matchboxes that could be fitted into a box measuring 18 cm by 25 cm by 10 cm?

Answer: .....

38. A rhombus has been drawn on the grid below.



The co-ordinates of three points are listed below.

$P(5, 3)$ $Q(5, 9)$ $R(4, 4)$

Write the letter names of the points that lie inside the rhombus.

Answer: .....

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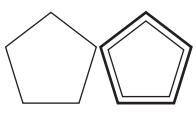
39. In order to convert from the imperial units ounces and pounds to the metric unit kilograms, you should use the following conversions:

16 ounces = 1 pound
2.2 pounds = 1 kg

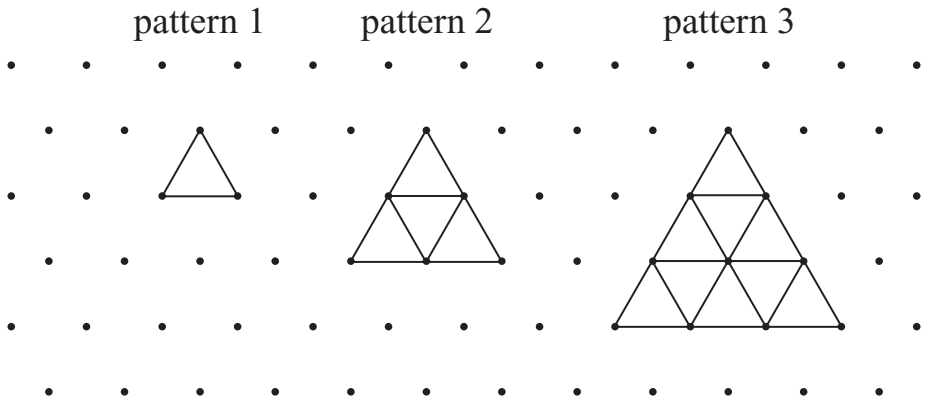
Newborn tiger cubs weigh about 56 ounces.

Circle the mass in kilograms which gives the best approximation of the mass of a newborn tiger cub.

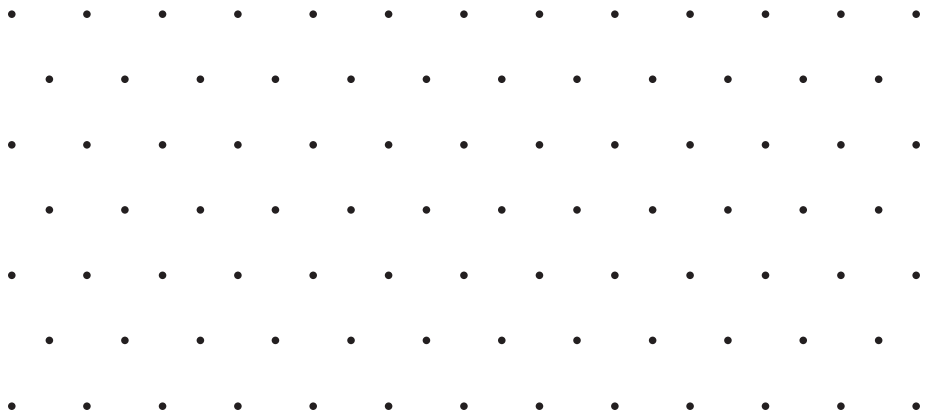
0.5 kg 1 kg 1.5 kg 2 kg 2.5 kg 3 kg



40. Here is a pattern made with small equilateral triangles using centimetre dotted isometric paper.



(a) Complete pattern 4 on the isometric paper below.



(b) Complete the table showing the number of lines, dots and small triangles in each pattern.

pattern number	1	2	3	4
number of small triangles	1	4		
perimeter (cm)	3			12
number of dots	3		10	

(c) How many small triangles are there in pattern 6?

Answer: ..... small triangles

(d) What is the perimeter of pattern 10?

Answer: ..... cm

(e) Which pattern has 45 dots?

Answer: pattern .....

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41. Two icebergs, A and B, are floating in the ocean.

On 1 January, iceberg A weighs 4 tonnes, but loses 25 kg every day.

1000 kg = 1 tonne

(a) After how many days will iceberg A weigh 3850 kg?

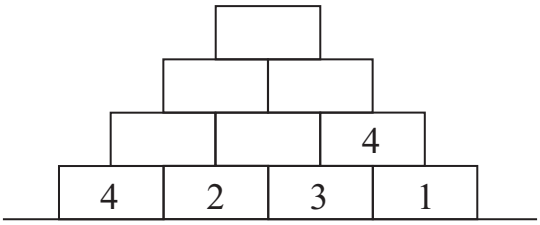
Answer: ..... days

On 1 January, iceberg B weighs 4500 kg and loses 50 kg every day.

(b) After how many days will the two icebergs have the same mass?

Answer: ..... days

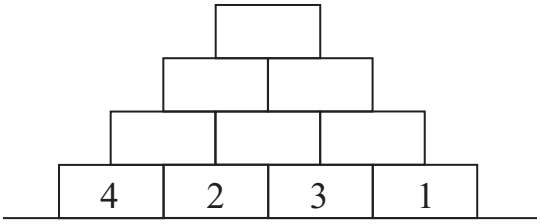
42. (a) In the tower of bricks below, the number on a brick is the **sum** of the numbers on the two bricks supporting it.



What number is on the top brick?

Answer: .....

(b) In the tower of bricks below, the number on a brick is the **product** of the two bricks supporting it.

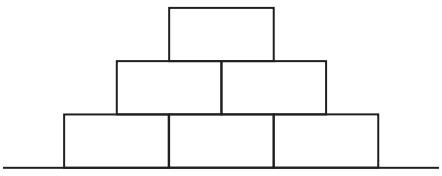


What number is on the top brick?

Answer: .....

(c) In the tower of bricks below, the number on a brick is the product of the two bricks supporting it.

The number on the top brick is 72 and the numbers on the bricks are all different whole numbers.



What number is on the middle brick in the bottom row?

Answer: .....

43. A number machine works to the rule

'cube each digit and then add the cubes together'.

For example:

input 46 gives output 280, as shown below

$$4^3 + 6^3$$
$$= 64 + 216$$
$$= 280$$

input 123 gives output 36

$$1^3 + 2^3 + 3^3$$
$$= 1 + 8 + 27$$
$$= 36$$

(a) Work out the output for input 25

Answer: .....

(b) What three-digit input would give output 3?

Answer: .....

Input 153 gives output 153

(c) Which two numbers between 300 and 400 will also give output 153?

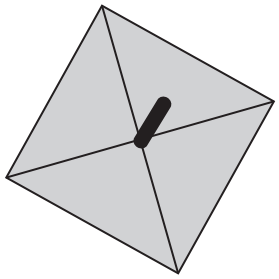
Answer: ..... and .....

44. Wendy has three spinners A, B and C.

(a) However many times spinner A is spun and the scores are added, you always get an even total.

Write a different number (choosing from 1 to 9) in each section of the spinner.

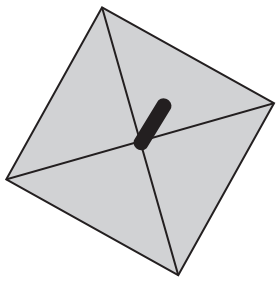
A



(b) When spinner B is spun, the result is always a prime number.

Write a different number (choosing from 1 to 9) in each section of the spinner.

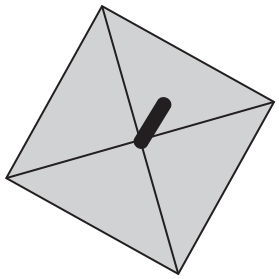
B



(c) When spinner C is spun there is an equal chance of getting a cube number or a multiple of 3

Write a different number (choosing from 1 to 8) in each section of the spinner.

C



(d) If each spinner is spun 100 times and the 100 scores added, which spinner is likely to score the highest total, and why?

Answer: ..... will score the highest total

because .....

.....

45. A bird has 2 legs, a cat has 4 legs, an insect has 6 legs and a spider has 8 legs.

Claire looks at some animals and counts all their legs.

She counts 38 legs.

There are twice as many birds as spiders and twice as many cats as insects.

How many of each type of animal can she see?

Answer: ..... birds

..... cats

..... insects

..... spiders

46. Tia adds three consecutive prime numbers

$5 + 7 + 11 = 23$

She does this two more times

$7 + 11 + 13 = 31$

$11 + 13 + 17 = 41$

Tia is delighted to see that the sum of three consecutive prime numbers seems to give another prime number.

(a) Complete the following statements:

(i) $17 + 19 + 23 =$ .....

(ii) ..... + ... + ... = 71

(iii) ..... + ... + ... = 83

The prime numbers between 20 and 140 are:
23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97, 101, 103, 107, 109, 113, 119, 127, 131, 137 and 139

(b) Which two groups of three consecutive prime numbers, between 10 and 50, have a sum which is **not** prime?

Answer: ..... + ... + ... = ...

..... + ... + ... = ...

(Total: 100 marks)