



ALDERLEY EDGE  
SCHOOL FOR GIRLS

11+ Entrance Examination

Monday 8 January 2018

**MATHEMATICS PAPER**

Time allowed: 1 hour

Calculators are *not* allowed.

Write your candidate number in the box below.

**CANDIDATE NUMBER**

\_\_\_\_\_

- There are **two sections** to this paper.
- **Section A:** Multiple choice questions. For each question use pencil to put a circle around the correct answer. If you make a mistake, rub it out and circle the correct answer. You should spend no more than 25 minutes on this section.
- **Section B:** The second section contains questions where you may need to show your methods and your working out. The last question is a puzzle-type question. If you finish this section you may go back to the earlier section if you need to.

**Results:**

<b>Section A</b>	/ 25
<b>Section B</b>	/ 50

## Section A

You may use rough paper for working out but this will not be marked. Only the answers you circle will be marked.

For each question, circle the correct answer in pencil.

1.

How much more than  $-3^{\circ}\text{C}$  is  $4^{\circ}\text{C}$ ?

A  $7^{\circ}\text{C}$

B  $1^{\circ}\text{C}$

C  $-7^{\circ}\text{C}$

D  $12^{\circ}\text{C}$

2.

What is  $3.6 \times 100$ ?

A 3.600

B 36

C 3600

D none of these

3.

Which of these numbers is *not* a factor of 105?

A 3

B 9

C 7

D 5

4.

Which of these fractions is the largest?

A  $\frac{6}{8}$

B  $\frac{5}{7}$

C  $\frac{4}{6}$

D  $\frac{3}{5}$

5.

What is the missing number in this number sentence?  $3.6 \times ? = 1.8 \times 7$

A 14

B 1.8

C 3.5

D 5.2

6.

What is the *eighth* number in this sequence? 3 8 13 18 23 .....

A 8

B 28

C 33

D 38

7.

If  $x = 2$  and  $y = 3$ , what is  $x + 2y$ ?

A 8

B 10

C 12

D 25

8.

a and b are two numbers. Is  $a + b$  the same as  $b + a$ ?

- A never      B sometimes      C always      D can't tell

9.

Below are two sequences. The number 7 appears in both sequences. What will be the *next* number to appear in both?

5 7 9 11

and

1 4 7 10

- A 5      B 26      C 21      D 13

10.

If z is 4, which is the largest of these numbers?

- A z      B  $z^2$       C  $z + z + z$       D 2z

11.

What is the volume of a cuboid having lengths 2cm, 3cm, and 5cm?

- A  $10 \text{ cm}^3$       B  $20 \text{ cm}^3$       C  $30 \text{ cm}^3$       D none of these

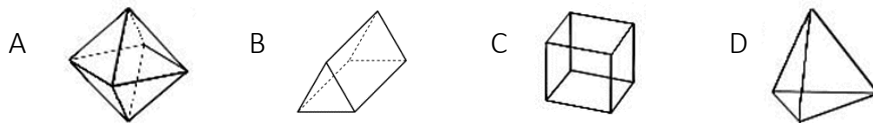
12.

If I look north and turn anticlockwise by  $270^\circ$  I am looking:

- A West      B East      C South      D North-East

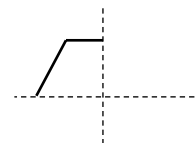
13.

Three of these shapes have an even number of edges. Which one does not?



14.

The diagram shows part of a regular shape along with its two lines of symmetry. The whole shape is called:



- A a square      B a kite      C a hexagon      D an octagon

15.

The *smallest* angle of an isosceles triangle is  $40^\circ$ . Another angle is:

- A  $70^\circ$       B not enough information to decide  
C  $40^\circ$       D  $60^\circ$

16.

Rachel chooses a letter at random from the word BEETROOT. Which has the *most likely* chance of being chosen – a vowel or a consonant?

- A vowel      B consonant      C equal chance      D can't say

17.

The range of a set of numbers is the difference between the highest and the lowest. What is the *range* of these numbers? 1 2 6 1 1 4 3

- A 6      B 5      C 2      D 1

18.

If you roll a fair dice 30 times, how many sixes are you most likely to get?

- A 0      B 30      C 5      D 6

19.

4 girls have an average height of 1.4m. Two more girls of heights 1.2m and 1.6m join them. The new average will:

- A stay the same      B increase      C decrease      D not enough information

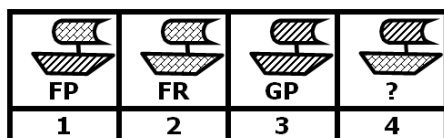
20.

Girls' favourite colours and boys' favourite colours are shown on two pie charts. On both charts the angle for 'blue' is  $60^\circ$ . Does this mean the same number of girls as boys chose blue as their favourite colour?

- A yes      B not enough information  
C usually      D no

21.

Each of these boat pictures has been given a code of two letters. Use pictures 1, 2 and 3 to work out the code, then decide which box (A, B, C or D) has the correct code for picture 4.



P	R	G	G
R	G	F	R
A	B	C	D

22.

How many  $60^\circ$  angles are in the shape on the right?



A 3

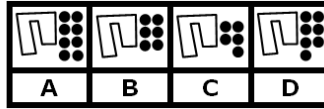
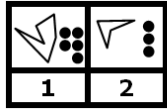
B 6

C 12

D 15

23.

Which of shapes A, B, C and D is most similar to shapes 1 and 2?



24.

Steve's calculator is broken. The + and the  $\times$  buttons are the wrong way round. Which of the following will **not** give an answer of 14 when typed into his calculator?

A  $3 + 4 \times 2$

B  $(3 + 4) \times 2$

C  $4 \times 5 + 2$

D  $3 \times 4 + 2$

25.

In this question the rule  $a \sim b$  means  $a + \frac{a}{b}$ .

For example,  $6 \sim 2$  means  $6 + \frac{6}{2}$  which is 9.

What is  $10 \sim 5$ ?

A 3

B  $5\frac{1}{2}$

C 12

D 15

## Section B

Answer these questions in the spaces provided. Show any working out needed.

### Number calculations

1. Write these numbers in descending order (*largest to smallest*)

8.02, 8.62, 8.2, 8.26, 8.002

(1)

2. Work out  $\frac{2}{5}$  of 255

(2)

3. Work out  $5.25 \times 10$

(1)

4. Subtract 33.3 from 204.7

(1)

5. Divide 600 by 15

(1)

6. Write 0.68 as a fraction

(1)

7. Work out  $\frac{3}{4} + \frac{5}{8}$

(1)

8. What is the difference between 21 and - 7

(1)

9. Multiply 5260 by 300

(1)

10. Work out  $3 + 6 \times 4$

(1)

## Application of number

11. Use +, −, × or ÷ to make each calculation correct (the first two have been done for you).

Examples:

$$2 \quad \mathbf{+} \quad \dots\dots\dots 4 = 7 \quad \mathbf{-} \quad \dots\dots\dots 1$$

$$5 \quad \mathbf{\times} \quad \dots\dots\dots 3 = 3 \quad \mathbf{\times} \quad \dots\dots\dots 5$$

$$5 \quad \dots\dots\dots 2 = 10 \quad \dots\dots\dots 3$$

$$12 \quad \dots\dots\dots 3 = 3 \quad \dots\dots\dots 3$$

$$2 \quad \dots\dots\dots 1 = 9 \quad \dots\dots\dots 3$$

(3)

12. I buy a widescreen television costing £1290. I pay £900 now, then I pay the rest of the money in 3 equal payments. How much is each payment? Show your working.

(2)



13. A single pen costs 60p. There is a special offer of 10 pens for £5.50.  
Lily wants to buy 23 pens as cheaply as possible. How much will she pay?

(2)

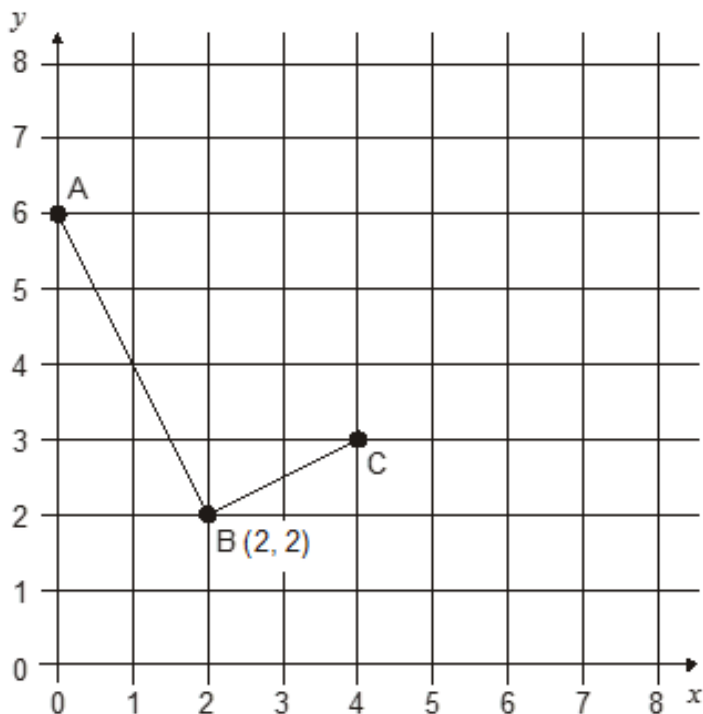
14. Beth sees a computer for sale for £480. After Christmas, the shop reduces the price by 25% in the January sales.

How much will the computer now cost?

(2)

Algebra & Reasoning

15. Look at the graph.



a) Write down the coordinates of points A and C.

A is (     ,     )

C is (     ,     )

(2)

b) Point D can be marked so that ABCD is a rectangle. Mark the point D accurately on the graph.

(1)

16. Bags A and B contain some counters.



a) If  $y = 4$ , how many counters are in each of the bags?

Bag A .....

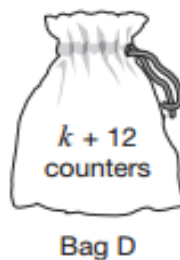
Bag B .....

(2)

b) If instead the number of counters in each bag is the same, work out the value of  $y$ .

(2)

Bag C contains **more** counters than bag D.



c) What is the **smallest** possible value of  $k$ ?

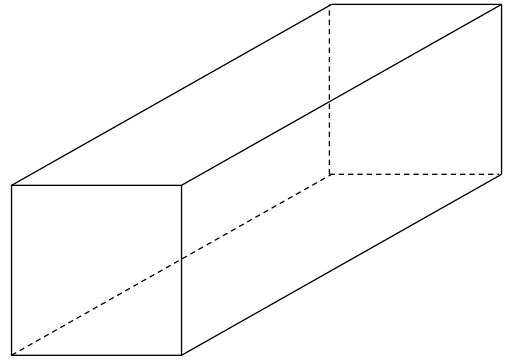
(1)

## Geometry & shape

17. Here is a cuboid.

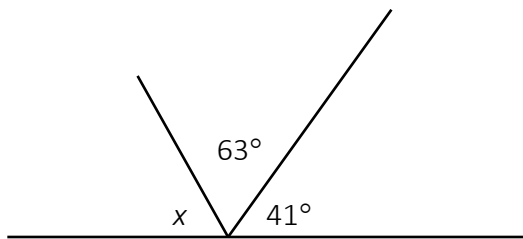
Write down the number of:

- a) Faces .....
- b) Edges .....
- c) Vertices .....

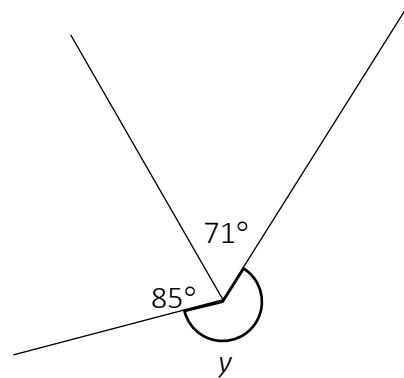


(3)

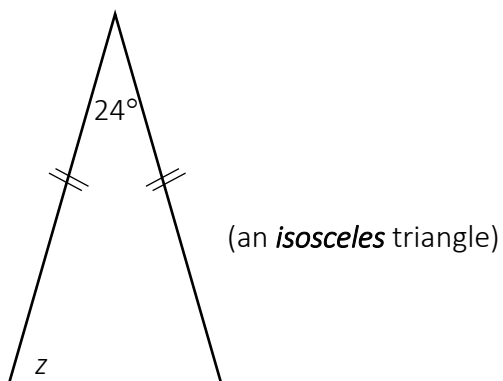
18. Calculate each of the angles marked  $x$ ,  $y$  and  $z$ .



$x = \dots\dots\dots$



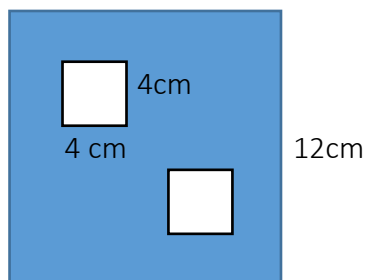
$y = \dots\dots\dots$



$z = \dots\dots\dots$

(3)

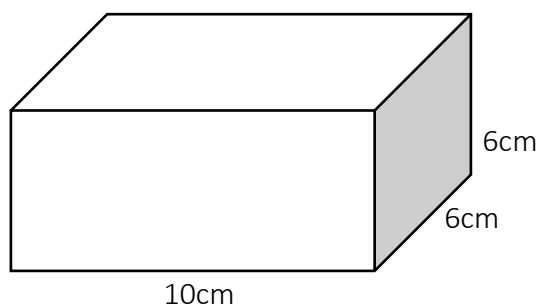
19. Two squares of side 4cm are cut out of a square piece of card of side length 12cm, as shown in the diagram.



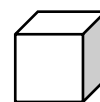
Work out the area of the remaining card.

(3)

20. This is a picture of a box and two small cubes.



cube  
of side  
length  
2cm



cube  
of side  
length  
3cm

How many cubes of side 2cm will fit inside the box?

(2)

How many cubes of side 3cm will fit inside the box?

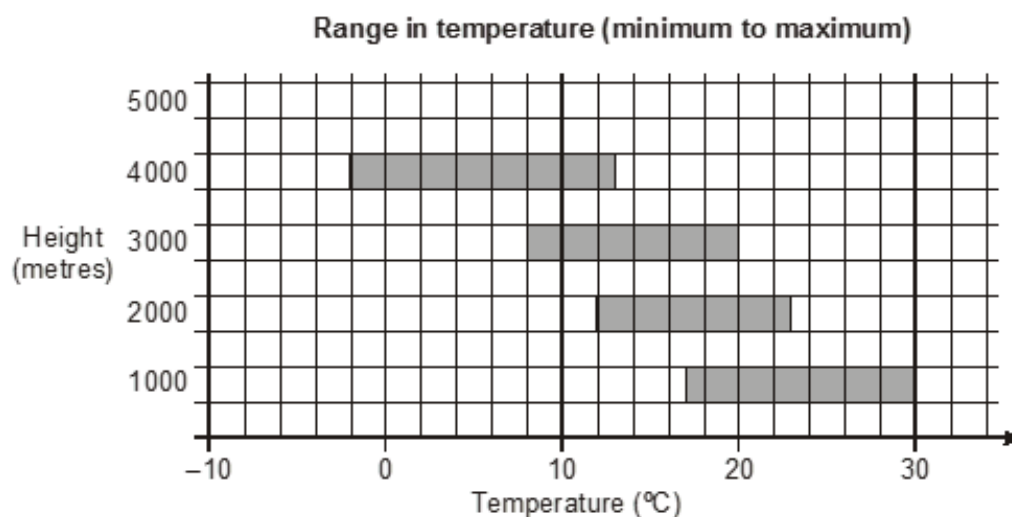
(2)

## Data & Probability

21. There are high mountains in Nepal.

At different heights, the temperature is different.

The graph shows information about temperatures in one month.



For example:

At 1000 metres, the minimum temperature is  $17^{\circ}\text{C}$  and the maximum temperature is  $30^{\circ}\text{C}$ .

a) At **3000** metres, what is the **minimum** temperature?

(1)

b) At **5000** metres, the minimum temperature is  $-3^{\circ}\text{C}$ .

The **range** in temperature is  $15^{\circ}\text{C}$ .

On the graph above, draw a bar to show this information.

(2)

22. Victoria has a dodgy dice. She rolls it 30 times and records the results in a tally chart.

1	2	3	4	5	6
		<del>    </del>	<del>    </del>		

a) Fill in the last column of the chart. (1)

b) Write as a fraction the proportion of times that Victoria's dice lands on a six.

Give your answer as a fraction in its lowest terms.

(2)

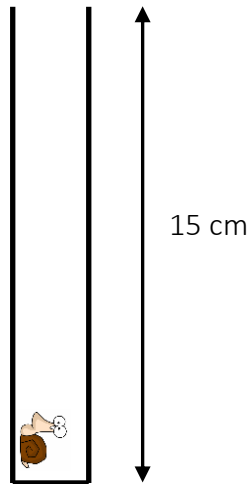
If she were to roll this dice 120 times, how many fours would you expect her to get?

(1)

## Puzzle Question

23. Sammy the snail is at the bottom of a hole that is 15 cm deep. Each day he starts to climb the hole; by the evening he has climbed 5 cm. However, overnight he slips back down by 2 cm.

If he starts to climb on Tuesday morning, on what day will he be able to crawl out of the hole? You must show how you worked it out!



(2)