YEAR 7 ENTRANCE AND SCHOLARSHIP EXAMINATION

Mathematics Specimen Paper

Your Last Name	
Your First Name	
Your Current School	
Candidate Number	

Time allowed for this paper: 1 hour

Instructions
- Attempt all the questions.
- Calculators must not be used.
- This test is designed to be challenging, so you may not find all the questions straightforward and you may not finish the whole paper. Do not spent too much time on any one question.
- All workings and calculations should be written in the spaces provided. Marks are awarded for correct workings, even if you don't get as far as an answer.
- Keep working steadily and carefully. Then if you have time at the end, go back and try to tackle any questions you did not find so easy when you first saw them.
- There are 100 marks available in total for this test.
- You must not write in the squares on the bottom right of each page.
- The marks available for each part of a question are given in square brackets.

1. Work out:

    a)   2019 – 567

Answer: _____ [2]

    b)   67 × 89

Answer: _____ [2]

    c)   81.9 ÷ 6

Answer: _____ [2]

    d)   17.4 + 8.78

Answer: _____ [2]

Page total:

2. Fill in the missing numbers in these sequences:

a)   15 , 22 , 29 , _____ , 43 , _____

[2]

b)   9 , 5 , 1 , _____ , _____

[2]

c)   96 , −48 , 24 , −12 , ____ , _____

[2]

3. Fill in the blanks to make the calculation correct.

a)   18 − 6 + 7 = _____

[1]

b) 21 − (_____ × 3) = 9

[1]

c) 16 − (-3)^2 = _____

[1]

Page total:

4. The perimeter of the rectangle below is 18 cm.

3 cm
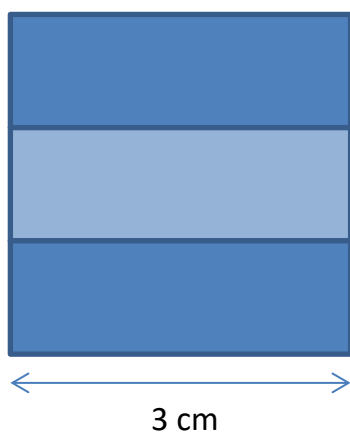
a) Find the width of the rectangle.

Answer: _____cm [1]

b) Find the area of the rectangle.

Answer: _____ cm^2 [1]

c) A square with sides of length 3 cm is divided into three identically sized rectangles. These are then arranged as shown. What is the perimeter of the new shape?
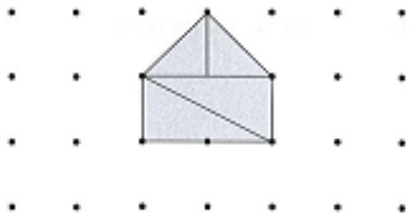

3 cm

Answer: _____ [2]

5. The diagram below shows 4 triangular pieces of card.

The pieces can be put together to form geometric shapes. The cards can be turned upside down or rotated if necessary. On the grid below the 4 pieces have been put together to make a pentagon.

On each grid below draw a diagram to show how all 4 pieces of card could be put together to form the named shape.

a)   A rectangle

[1]

b)   A parallelogram that is not a rectangle

[2]

Page total:

6.

a) Round 649 to the nearest 100

Answer: _____ [1]

b) Round 832 to the nearest 10

Answer: _____ [1]

c) A number has been rounded to the nearest 10 to give 370. What is the smallest whole number possible?

Answer: _____ [1]

7.

a) Calculate $0.4 + \frac{1}{4} + \frac{27}{100}$

Answer: _____ [2]

b) Write $\frac{51}{60}$ as a decimal

Answer: _____ [2]

Page total:

8. Find:

    a) One third of £120

    Answer: £_____ [1]

    b) 40% of £728

    Answer: £_____ [2]

9. A sleeper train travels from London to Glasgow. The train departs at 11:28 pm and arrives at 06:53 am.

    a) How long does the journey take?

    Answer: _____ hours_____minutes [2]

    b) A different train travels from London to Edinburgh at constant speed. The journey takes 3 hours and 30 minutes and the distance travelled is 420 miles. Calculate the speed of the train.

    Answer: _____ mph [2]

Page total:

10. You are given the following five numbers: 34, 21, 35, 42, 28

a)   Find the mean of these five numbers.

Answer: _____ [1]

b)   Find the median for these five numbers.

Answer: _____ [1]

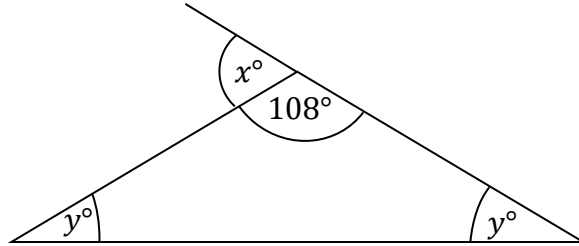c)   Find the range of these five numbers.

Answer: _____ [1]

d)   A sixth number is added to the list and the mean changes to 33. Find what this sixth number was.

Answer: _____ [2]

Page total:

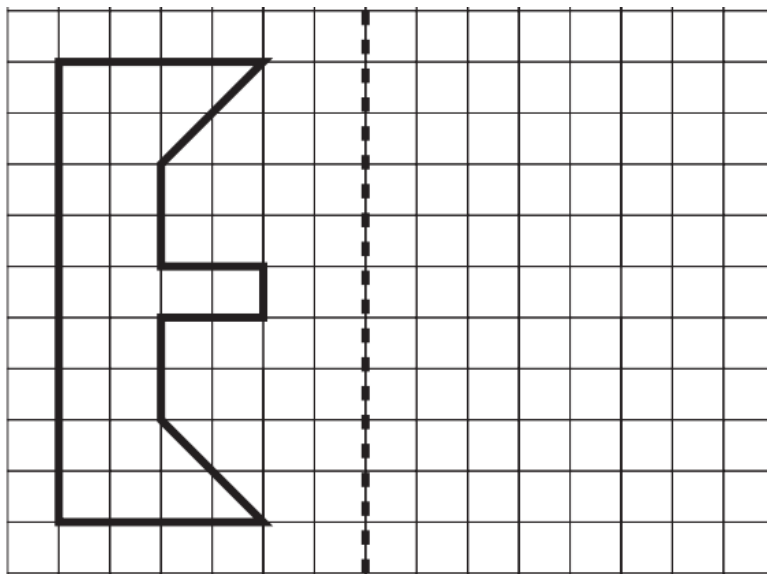11. The diagram shows a triangle and a line. The two angles marked $y°$ are equal.

$x°$

$108°$

$y°$

$y°$

a)   Work out the value of x

Answer: _____ [1]

b)   Work out the value of y

Answer: _____ [2]

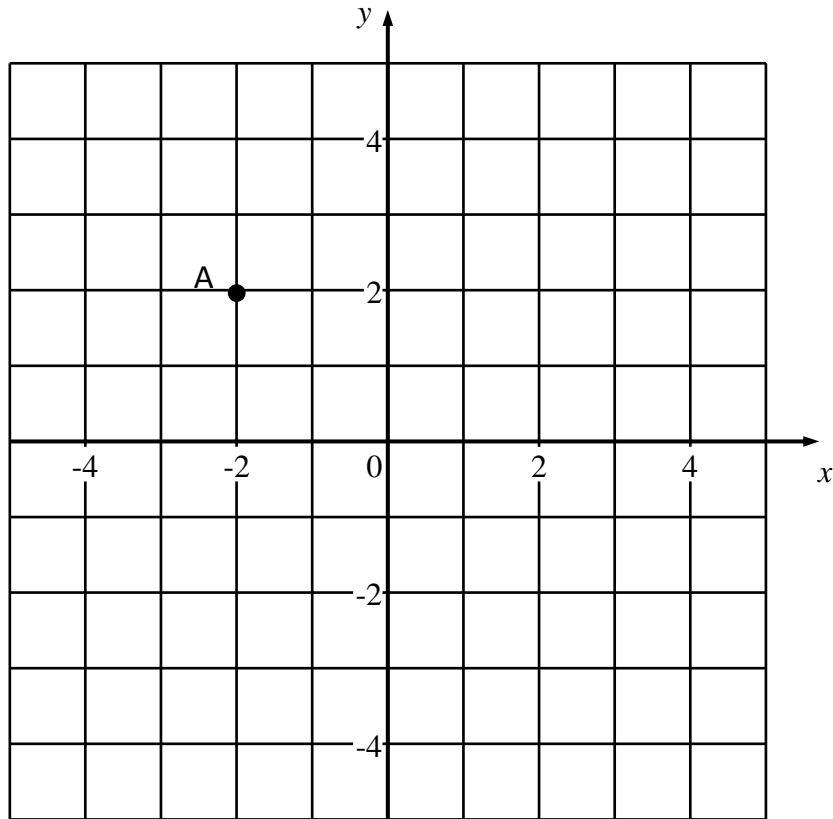12. Draw the reflection of each shape in the mirror line as shown.
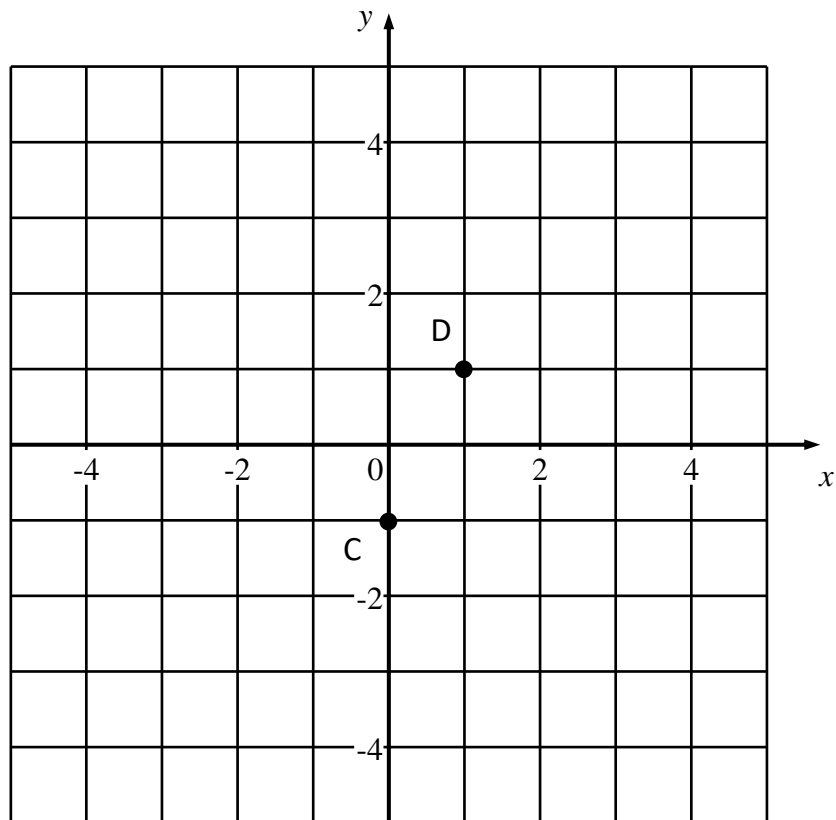
[1]

Page total:

13.

a)   Plot the point (4, -2) and label it B.

[1]

b)   Plot the point that is midway between A and B and write down its coordinates below.
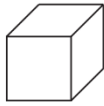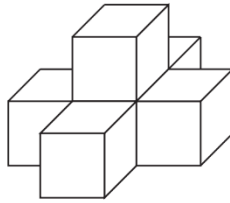
Answer: (_____,_____) [2]

c)   Point D is the point midway between the points C and E. Find the coordinates of the point E.
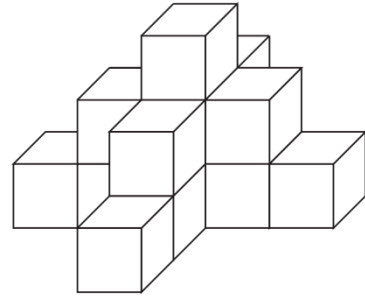
Answer: (_____,_____) [2]

14. A set of solid towers are made by adding layers as shown below. The shape is solid inside with no missing blocks.

1   2   3

a)   How many cubes are needed to build tower number 2?

Answer: _____ [1]

b)   How many cubes are needed to build tower number 3?

Answer: _____ [1]

c)   Without drawing it, how many cubes would be needed to build tower number 5?

Answer: _____ [2]
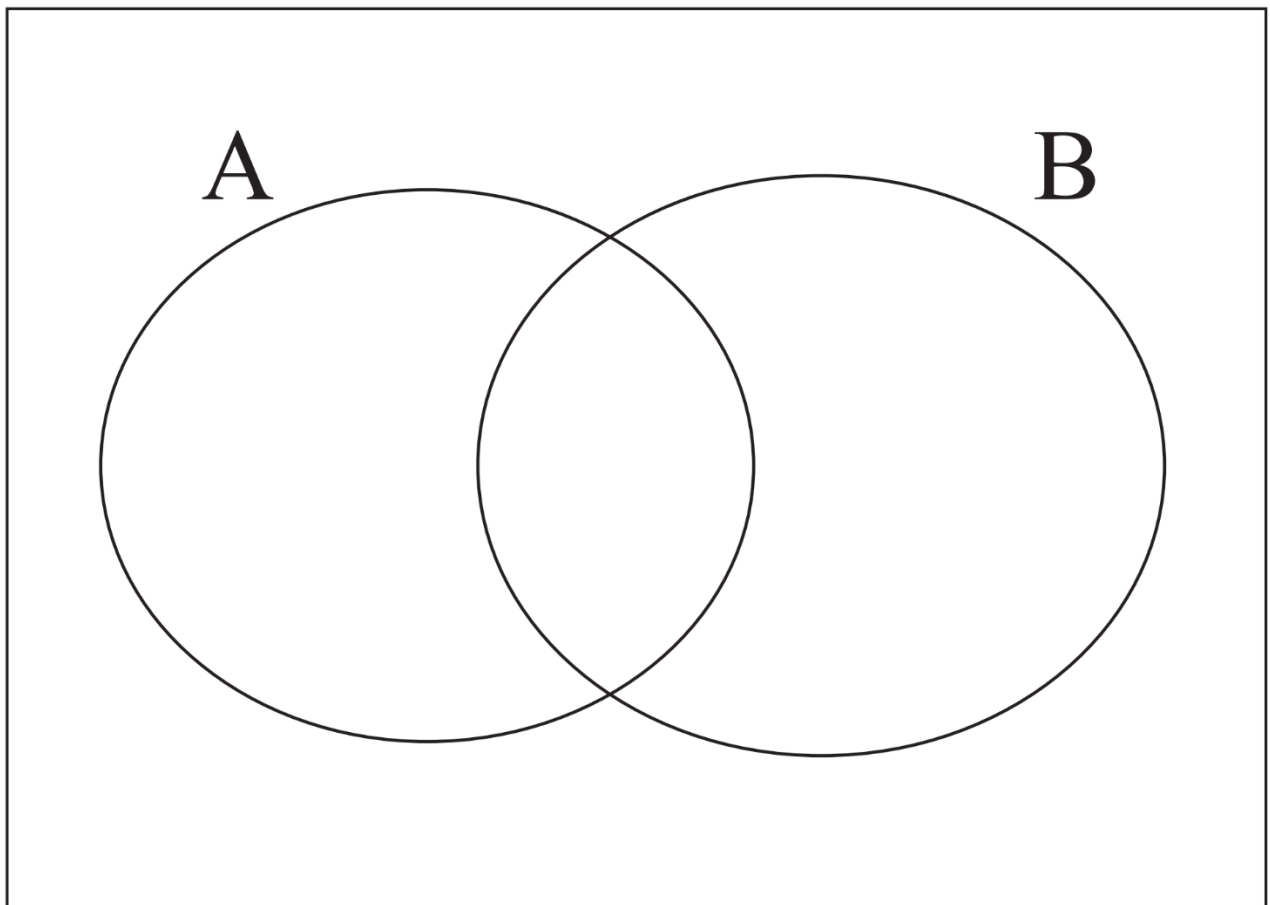
d)   Which tower number would contain 120 cubes?

Answer: _____ [2]

Page total:

15. Write all the square numbers between 1 and 100, inclusive, in the correct region in the diagram below.

Circle A needs to contain factors of 360.

Circle B needs to contain multiples 4.

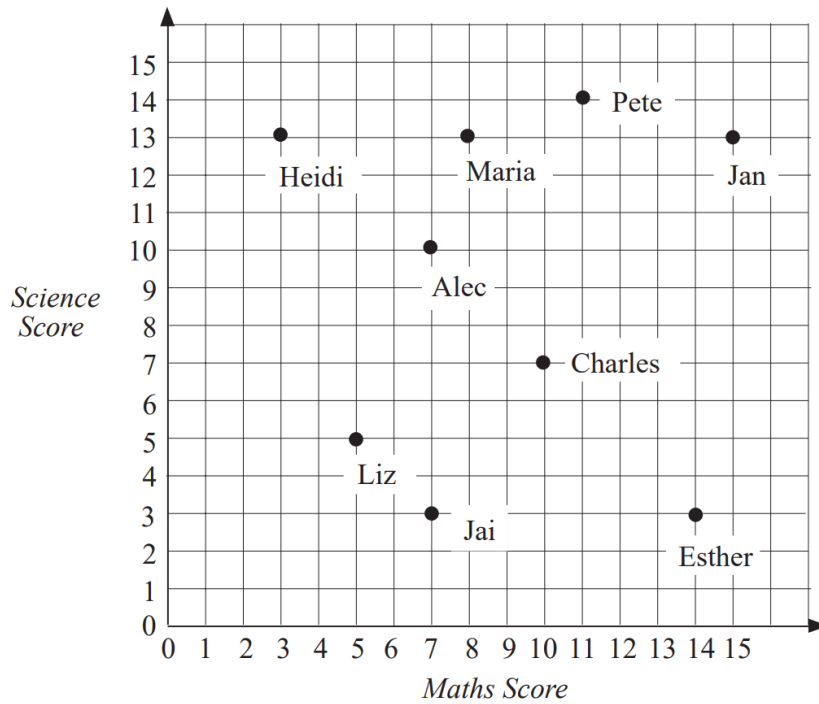You will need to put some numbers outside of the two circles.

A   B

[4]

16. The scatter plot shows the maths and science scores for 9 pupils.

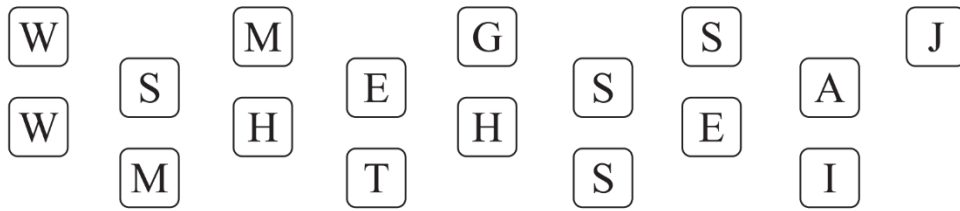a)   Who had the highest score in maths?

Answer: _____ [1]

b)   Who is good at science and poor at maths?

Answer: _____ [1]

c)   The total of the two scores are added together. Who has the highest total?

Answer: _____ [2]

Page total:

17. Some children in a class write down the first letter of their surname on a card;
    these cards are shown below:

W		M		G		S		J
	S		E		S		A	
W		H		H		E		
M		T		S		I	

A card is chosen at random.
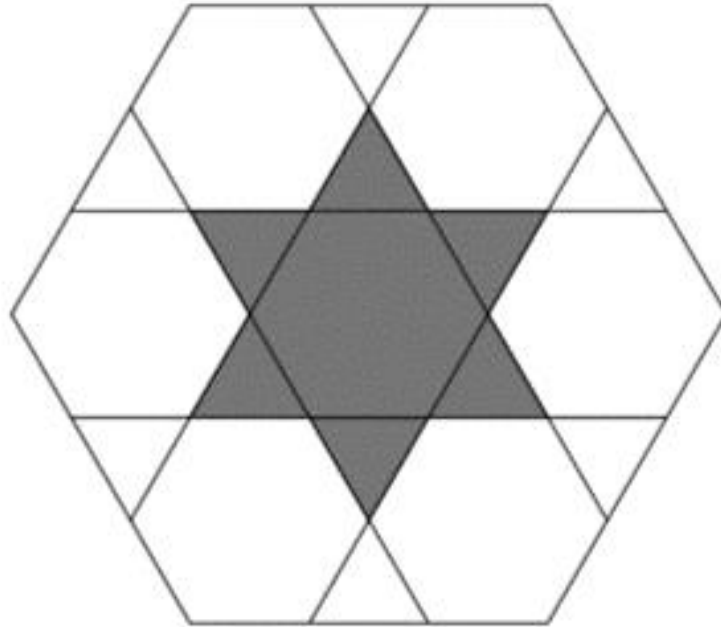
a)   Which letter is most likely to be taken?

Answer: _____ [1]

b)   Give two letters that have the same probability of being chosen as an E?

Answer: _____ [2]

18. The diagram shows a design formed by drawing six lines in a regular hexagon. The lines divide each edge of the hexagon into three equal parts. What fraction of the hexagon is shaded?
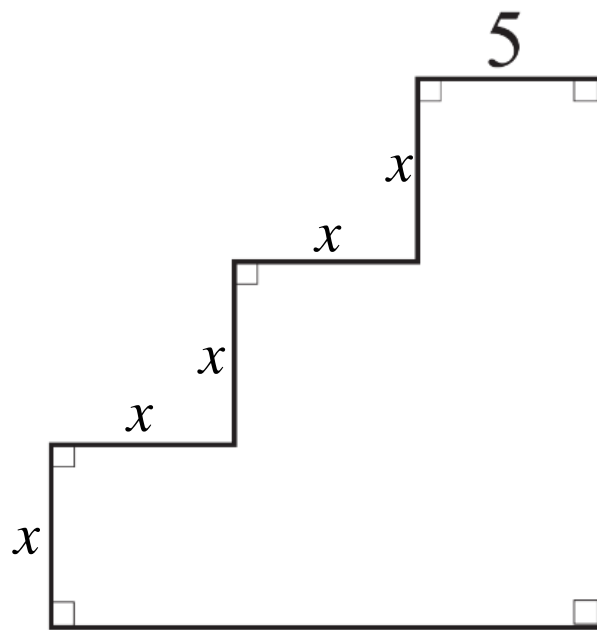

Answer: _____ [3]

19. Whilst driving to work Alison noticed that there were nine lamp posts equally spaced along a road. The distance from the first to the third is 60m. How far is it from the first to the last?

Answer: _____ [2]

Page total:

20. The perimeter of this shape is 40 units. The sides labelled x are all the same length. Find the length of one of these sides.

Answer: _____ [3]

21. The instruction $x * y$ means subtract x from y and then multiply by 3.

For example $2 * 6 = (6 - 2) \times 3 = 12$

a)   Work out the value of $20 * 27$

Answer: _____ [1]

b)   Work out the value of $10 * 6$

Answer: _____ [1]

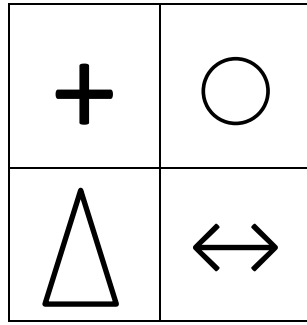c)   Work out the value of a if $3 * a = 6$

Answer: _____ [1]

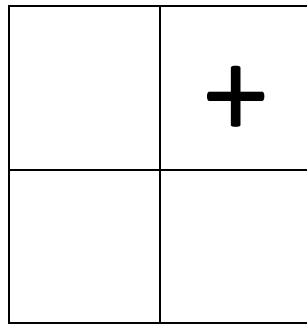d)   Work out the value of b if $b * 5 = 9$

Answer: _____ [1]

e)   Work out the value of c if $c * 5 = 4 * c$

Answer: _____ [1]

Page total:

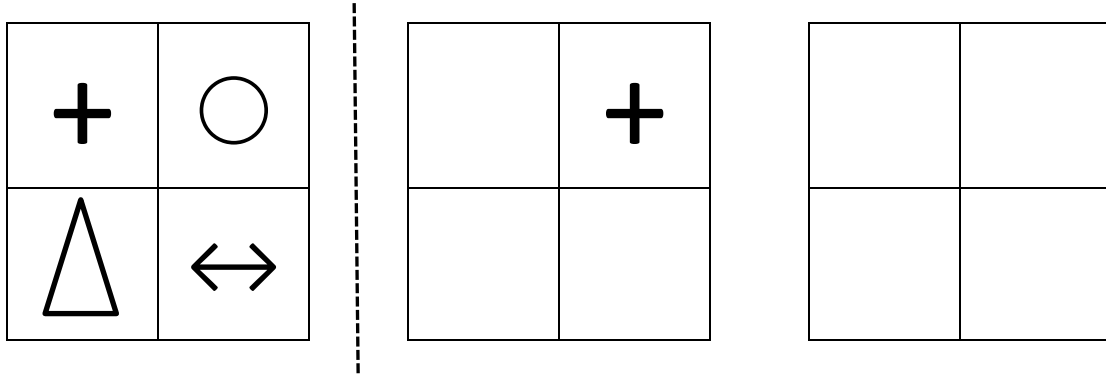22. Sarah has designed a tile for her new kitchen as shown below.

a) Complete the grid below to show the tile if it is **rotated** through a quarter turn clockwise.

[1]

b) Sarah decides to **reflect** the tile in the dashed line shown below and **then rotate** it through half a turn.
Draw the resulting tile on the grid below. You may complete the middle tile if you wish.

[2]

Page total:

23. For each of the following questions you need to find a whole number between 0 and 100 that has all of the following properties.

a) When the number is divided by 5 the remainder is 4.
   When the number is divided by 6 the remainder is 0.
   When the number is divided by 7 the remainder is 0.
   What is the number?

Answer: _____ [2]

b) When the number is divided by 2 the remainder is 1.
   When the number is divided by 3 the remainder is 1.
   When the number is divided by 5 the remainder is 0.
   When the number is divided by 7 the remainder is 1.
   What is the number?

Answer: _____ [2]

24. In this subtraction, P, Q, R, S and T represent single digits.

$$
\begin{array}{r}
7\ \ Q\ \ 2\ \ S\ \ T \\
-\ P\ \ 3\ \ R\ \ 9\ \ 6 \\
\hline
2\ \ 2\ \ 2\ \ 2\ \ 2 \\
\hline
\end{array}
$$

Find the values of P, Q, R, S and T.

P: _____ [1]

Q: _____ [1]
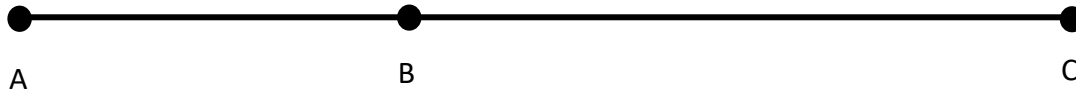
R: _____ [1]

S: _____ [1]

T: _____ [1]

Page total:

25. Anastasia thinks of a positive integer, which Barry then doubles. Next, Charlie trebles Barry's number. Finally, Damien multiplies Charlie's number by six. Eve notices that the sum of these four numbers is a perfect square. What is the smallest number that Anastasia could have thought of?

Answer: _____ [3]

26.

A   B   C

Calum and his friend cycle from A to C, passing through B.

During the trip he asks his friend how far they have cycled.

His friend replies "one third as far as it is from here to B".

Ten miles later Calum asks him how far they still have to cycle to reach C.

His friend replies again "one third as far as it is from here to B".

How far from A will Calum have cycled when he reaches C?

Answer: _____ [3]

End of the Examination

**If you have time, go back and check your answers and
make sure that you have shown all of your working.**