SHEBBEAR COLLEGE

ENTRANCE EXAMINATION

11+

MATHEMATICS

1 HOUR

NAME.....

Do your working on the paper and write your answers in the spaces provided. Calculators are not allowed.

1. (a) Write in figures the number ten thousand and thirty-eight.

Answer: ..... (1)

(b) Write in words the number 57 210

Answer: .....

..... (1)

(c) What is the value of the 7 in each of the following numbers?

(i) 4718 Answer: ..... (1)

(ii) 347 520 Answer: ..... (1)

(d) Calculate

(i) 8267 + 744

Answer: ..... (2)

(ii) 4000 – 365

Answer: ..... (2)

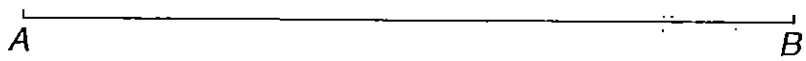
(iii) 34 × 7

Answer: ..... (2)

(iv) 259 ÷ 7

Answer: ..... (2)

2.



(i) Measure the line *AB*.

Answer: ..... cm (1)

(ii) On the line *AB* mark the point *P* which is 2.5 cm from *A*. (1)

(iii) What fraction of *AB* is *PB*?

Answer: ..... (2)

3. Choose from this set of numbers

7	8	9	10
11	12	13	14

(i) a square number Answer: ..... (1)

(ii) a multiple of 5 Answer: ..... (1)

(iii) three prime numbers Answer: ..... , ... , ... (3)

(iv) two factors of 24 Answer: ..... , ... (2)

4. Dinoworld charges £9.50 for an adult and £8.25 for a child.

Find the total cost for a family of four adults and three children to go to Dinoworld.

Answer: £..... (5)

5. Curtain track costs £3.75 per metre.

(i) How much will it cost to buy 10 metres?

Answer: £..... (1)

(ii) Mr Brown buys a length costing £15

How many metres does he buy?

Answer: ..... (2)

6. Look at these numbers:

2.03 2.302 3.2 2.3 2.32

Write them in order of size, starting with the smallest.

Answer: smallest ..... largest (3)

7. Exercise books come in packs of 25

The school needs 480 exercise books.

(i) How many packs must be bought?

Answer: ..... (3)

Each pack costs £6

(ii) Find the total cost of the exercise books bought by the school.

Answer: £..... (2)

8. A drawer contains 28 socks of which 20 are black and the rest are grey.

IMPOSSIBLE **UNLIKELY** **EVENS** **LIKELY** **CERTAIN**

Which word best describes the following probabilities?

(i) I pick a sock at random and it is black.

Answer: ..... (1)

(ii) I pick a sock at random and it is red.

Answer: ..... (1)

9. Look carefully at this number pattern.

$1^2 + 3 = 4$
$2^2 + 5 = 9$
$3^2 + 7 = 16$

Write the next two lines of the pattern.

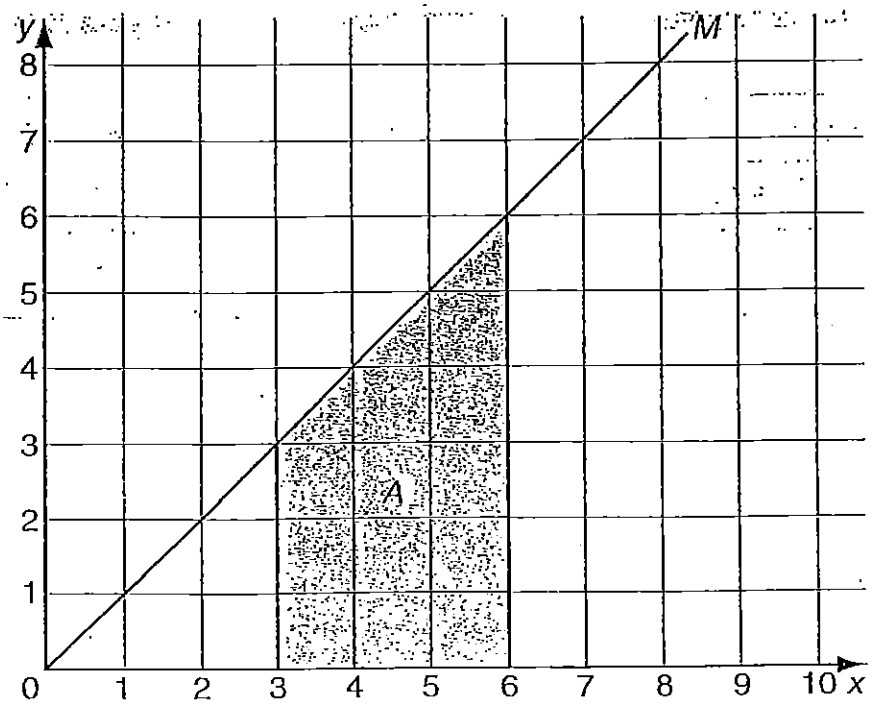
Answer: .....

..... (4)

10. Stephen is 1.88 m tall. Rachel is 1.39 m tall.
How much taller than Rachel is Stephen?
Give your answer in centimetres.

Answer: ..... cm (2)

11.



(i) Name the shaded shape *A*.

Answer: ..... (1)

(ii) On shape *A*, mark with a star, $*$, an obtuse angle. (1)

(iii) Reflect *A* in the mirror line *M* and shade the reflection you obtain. (1)

(iv) How many squares have now been shaded altogether?

Answer: ..... (2)

12. This frequency table shows Ann's scores out of ten in history tests:

score out of 10	5	6	7	8	9	10
frequency	1	4	5	3	1	1

(i) What was the range of her scores?

Answer: ..... (2)

(ii) How many times did she score 8?

Answer: ..... (1)

(iii) How many tests did she do?

Answer: ..... (2)

(iv) Which score was the mode?

Answer: ..... (1)

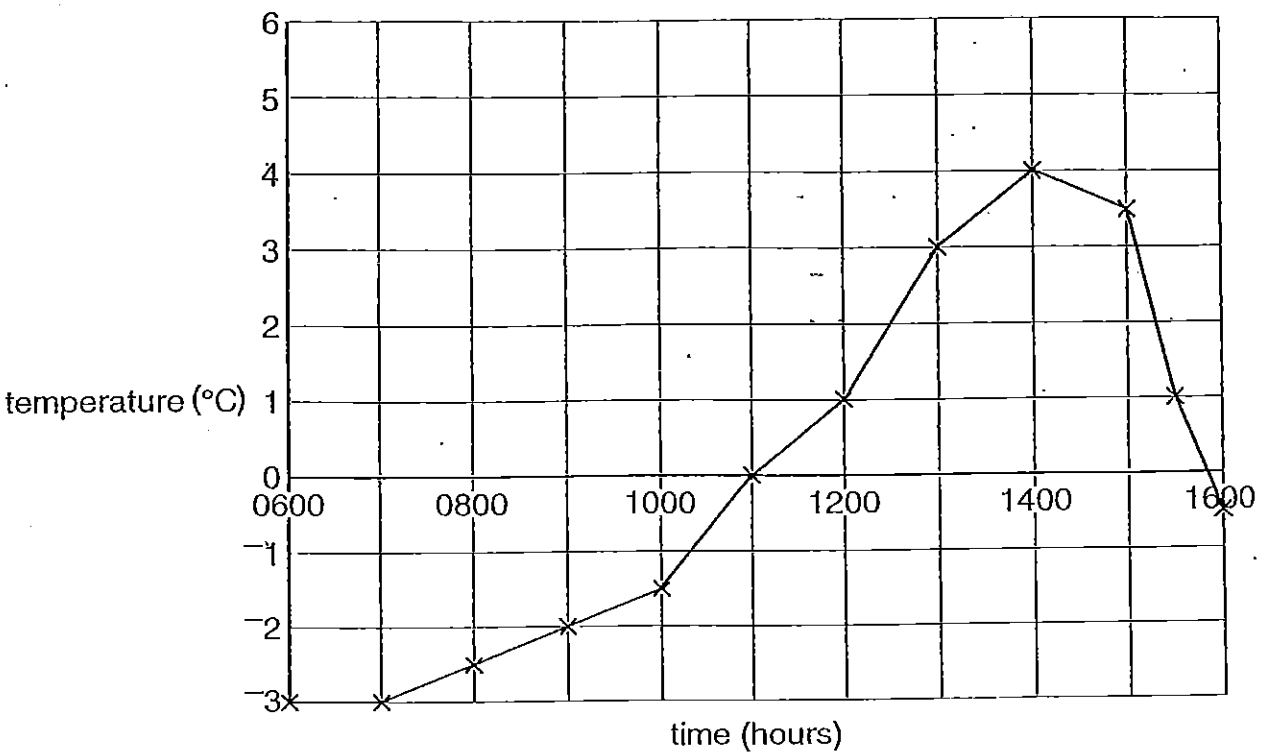
(v) How many of her scores were more than half marks?

Answer: ..... (1)

(vi) What was Ann's median score?

Answer: ..... (2)

13. (i) This line graph shows the temperature outside, measured every hour from 0600 to 1600 one day in winter.



(a) What was the temperature at 0900?

Answer: .....°C (1)

(b) In which hour was the greatest increase in temperature?

Answer: between ..... and ..... (1)

(c) Estimate the temperature at 1030

Answer: .....°C (1)

(d) How many degrees warmer was it at 1400 compared with 0600?

Answer: ..... degrees (1)

(ii) This table shows the temperature inside Mary's greenhouse on the same day.

time	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600
temp (°C)	2	2	3	3.5	4	4.5	5	6	6	5	4

Plot these points on the grid opposite and draw the line graph. (4)

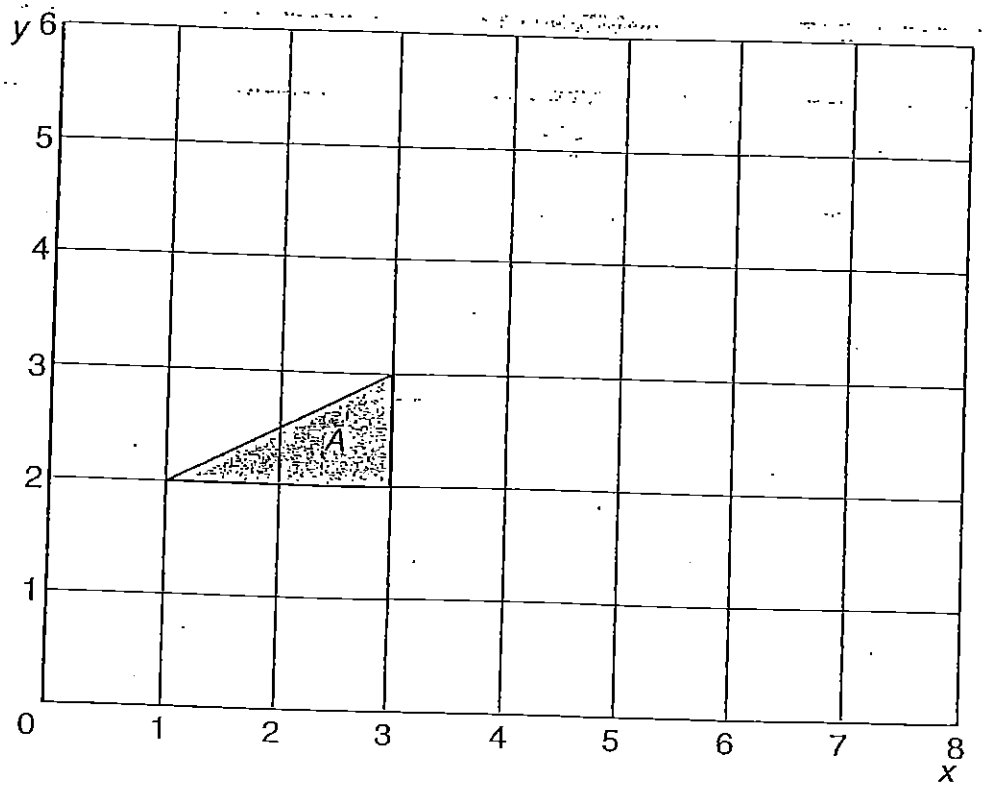
(a) At what time was there the smallest difference between the temperature inside and the temperature outside?

Answer: ..... (2)

(b) What was the temperature difference, in degrees, at that time?

Answer: ..... degrees (1)

14.



(i) Rotate triangle *A* through 180° about the point (3, 2).
Label the new triangle *B*.

(2)

(ii) Translate triangle *A* 3 units to the right and 2 units up the page.
Label the new triangle *C*.

(2)

(iii) In a space on the grid, draw and label a triangle *D* which is **not** congruent to triangle *A*.

(1)

15 

Paula has these four strips of card.

She can put them end to end as shown here, to make other lengths.

$1 + 3 = 4$

She can use two or more strips each time.

(i) Draw freehand sketches to show how she can make the following lengths.

(a) 7

(1)

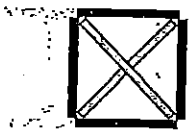
(b) 9

(1)

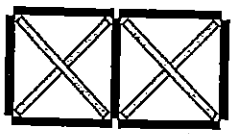
(ii) What is the longest strip she can make?

Answer: ..... (1)

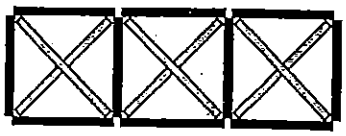
16. Look at the following patterns made from grey sticks and black sticks.



pattern 1



pattern 2



pattern 3

(i) Draw pattern 4

(1)

(ii) Complete the following table for patterns 1 to 4

pattern number	number of black sticks	number of grey sticks
1		
2		
3		
4		

(3)

(iii) Extend the table for patterns 5 and 6 (2)

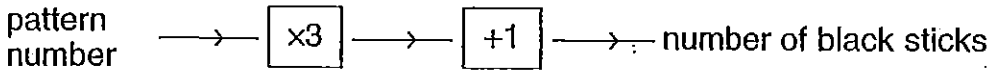
(iv) Describe a rule to find the number of grey sticks needed when you are told the pattern number.

Answer: .....

.....

(2)

(v) Jane suggests a flow-chart rule for finding the number of black sticks.



(a) Use Jane's idea to find the number of black sticks for pattern number 100

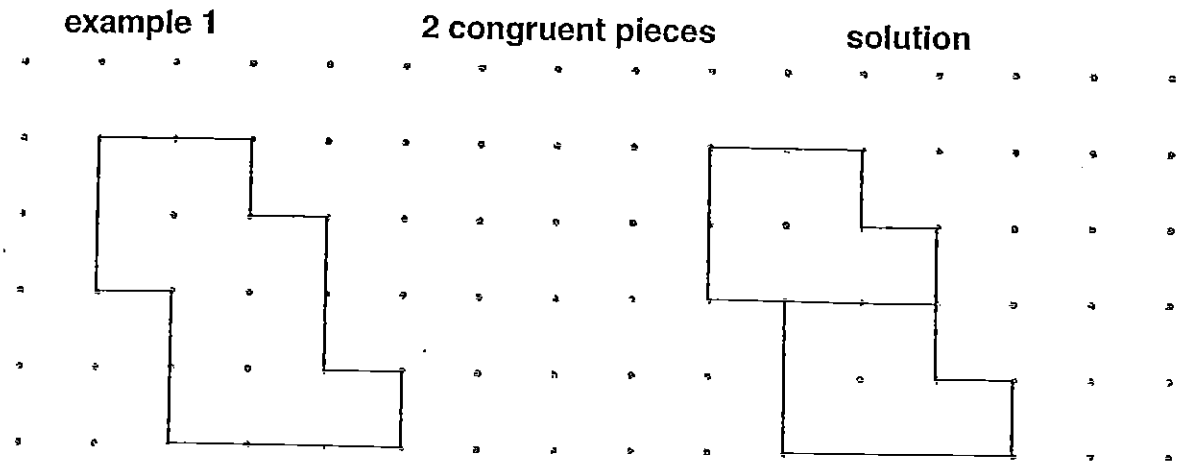
Answer: ..... (1)

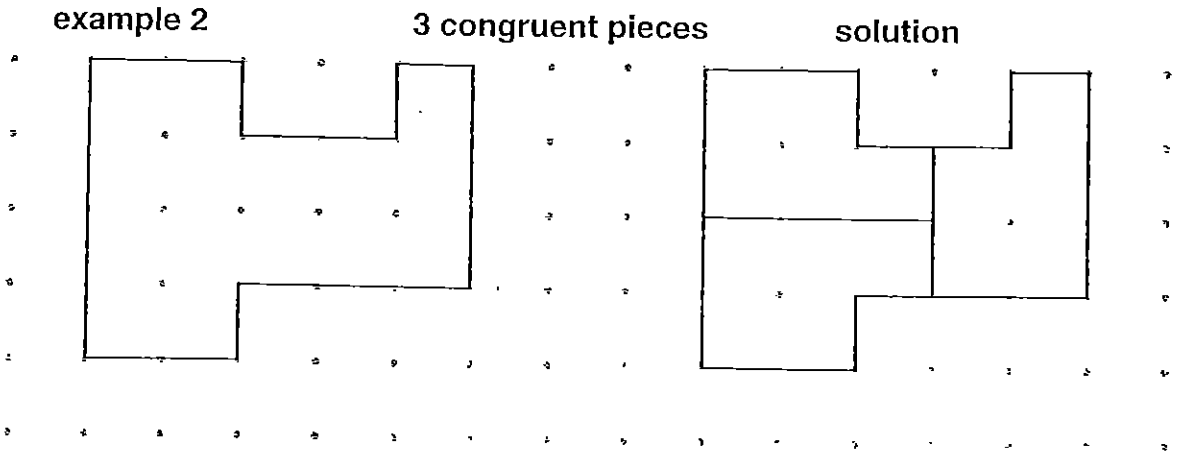
(b) Which pattern number has 61 black sticks?

Answer: ..... (1)

You are advised not to spend too long on this question.

17. Study these two examples of *congruence puzzles*.





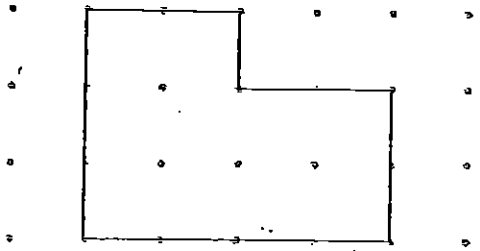
The idea is to divide the shape into the stated number of congruent pieces.
Both examples above make use of the same basic piece.

In **example 1**, translation has been used to find the position of the second piece.

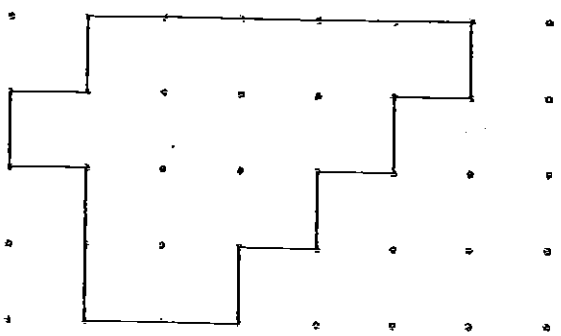
In **example 2**, reflection and rotation have been used.

(i) Divide these shapes in the same way.

(a) 2 congruent pieces



(b) 3 congruent pieces

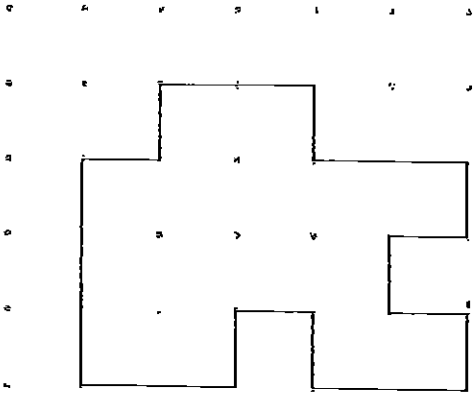


(2)

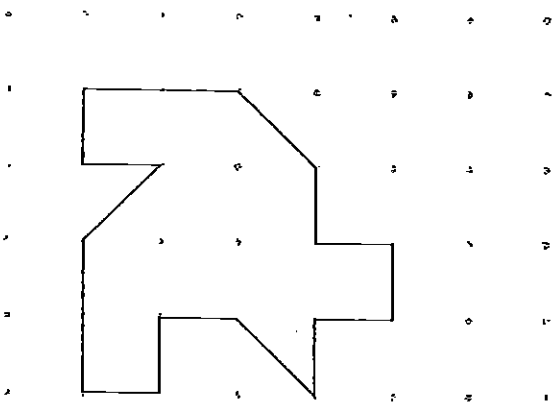
Hint: These puzzles use the same basic piece as the examples on page 16.

(ii) In these two puzzles you will need to decide what the basic pieces are.

(a) 3 congruent pieces

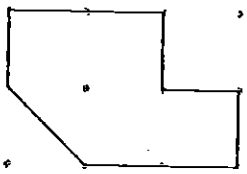


(b) 3 congruent pieces



(2)

(iii) Use the basic piece drawn here to make up two puzzles.



(a) 3 congruent pieces

(b) 4 congruent pieces

(2)

Show clearly how your basic pieces fit together to form the puzzle shape.

(iv) If you have time, make up (clearly showing the solutions) a few more congruence puzzles. Be as imaginative as you can and write brief notes if you wish to explain the mathematics you have used (as in the examples 1 and 2 on page 16).

(4)

(Total marks: 100)