SURNAME ..... FIRST NAME .....

JUNIOR SCHOOL ..... SENIOR SCHOOL .....

Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

MATHEMATICS

LEVEL 1: NON-CALCULATOR PAPER

Monday 27 January 2014

Please read this information carefully before the examination starts.

- This examination is 60 minutes long.
- **All** questions should be attempted.
- A formula sheet is included to help you.
- A row of dots ..... denotes a space for your answer.
- You must show all your working or you may receive no marks.
- Answers given as fractions should be reduced to their lowest terms.

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1. (a) Work out the following:

(i) 7×8

Answer: ..... (1)

(ii) $72 \div 9$

Answer: ..... (1)

(b)

21	25	29	33	36	39

From the list of numbers in the box above write down:

(i) a prime number

Answer: ..... (1)

(ii) a multiple of seven

Answer: ..... (1)

2. (i) Fill in the missing numbers for the metric conversions below.

(a) 370 centimetres = ... metres (1)

(b) 4.5 litres = ... millilitres (1)

(c) 12 tonnes = ... kilograms (1)

(ii) (a) Circle the object below which could be 5 metres in length.

a man's leg a room a cruise ship a mouse (1)

(b) Circle the object below which could have a mass of 1 tonne.

a child a television a car a jumbo jet (1)

3. (a) Calculate

(i) 594 – 267

Answer: ..... (2)

(ii) 594 + 267

Answer: ..... (2)

(b) Work out the cost of 26 footballs at £7 each.

Answer: £ ..... (2)

4. (i) Write 9% as a decimal.

Answer: ..... (1)

(ii) (a) Write the missing number in the box.

$$\frac{9}{25} = \frac{\square}{100}$$ (1)

(b) Write $\frac{9}{25}$ as a percentage.

Answer: .....% (1)

(iii) Write the following numbers in order, starting with the smallest first:

0.33 9% $\frac{9}{25}$

Answer: ....., ..., ... (1)

5. Farmer Matthew's chickens lay a total of 100 eggs.

(i) If he packs 6 eggs in each box, how many boxes can he completely fill?

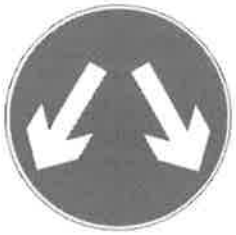
Answer: ..... (2)

(ii) How many eggs does he have left over?

Answer: ..... (1)

6. (a) Look at the road signs below.

A



B



C



D



Write down the letter of a road sign which has

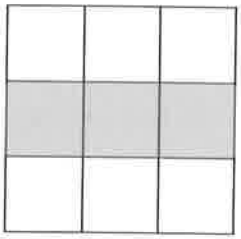
(i) one line of symmetry Answer: ..... (1)

(ii) rotational symmetry of order 2 Answer: ..... (1)

(iii) no rotational symmetry Answer: ..... (1)

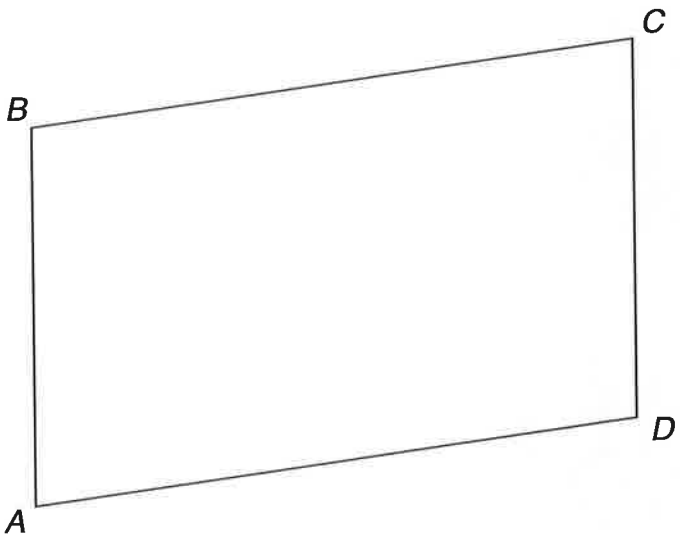
(iv) four lines of symmetry Answer: ..... (1)

(b) Shade in two squares so that the final pattern has no lines of symmetry but rotational symmetry of order 2



(1)

7. (a) Look at the parallelogram below.



(i) Mark with an arrow (>) a pair of parallel lines. (1)

(ii) Measure the length of *BC*.

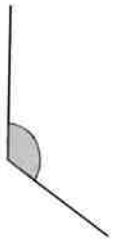
Answer: *BC* = ... cm (1)

(iii) Work out the perimeter of this parallelogram by measurement.

Answer: ..... cm (3)

(b) Look at these three angles *a*, *b* and *c*.

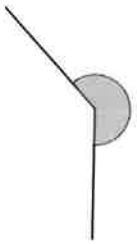
angle *a*



angle *b*



angle *c*



(i) Which of these angles measures about 130°?

Answer: ..... (1)

(ii) Which angle is a reflex angle?

Answer: ..... (1)

8. (a) Work out

(i) 7^2

Answer: ..... (1)

(ii) $12 + 6 \div 3$

Answer: ..... (2)

(b) Fill in the missing numbers:

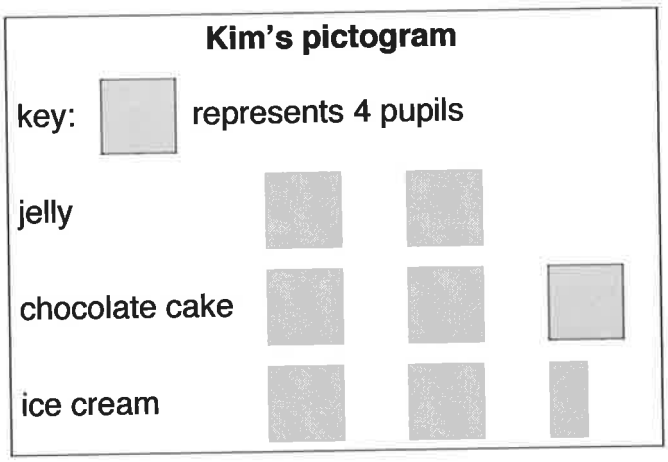
(i) $45 \div \ldots\ldots\ldots = 5$ (1)

(ii) $6 \times 100 = 900 - \ldots\ldots\ldots$ (1)

(iii) $56 \div 7 = 2 \times (3 + \ldots\ldots\ldots)$ (2)

9. Kim and Tim record which dessert each pupil in their class likes best.

(i) Kim draws this pictogram:



(a) Which is the least popular dessert?

Answer: ..... (1)

(b) How many pupils like chocolate cake?

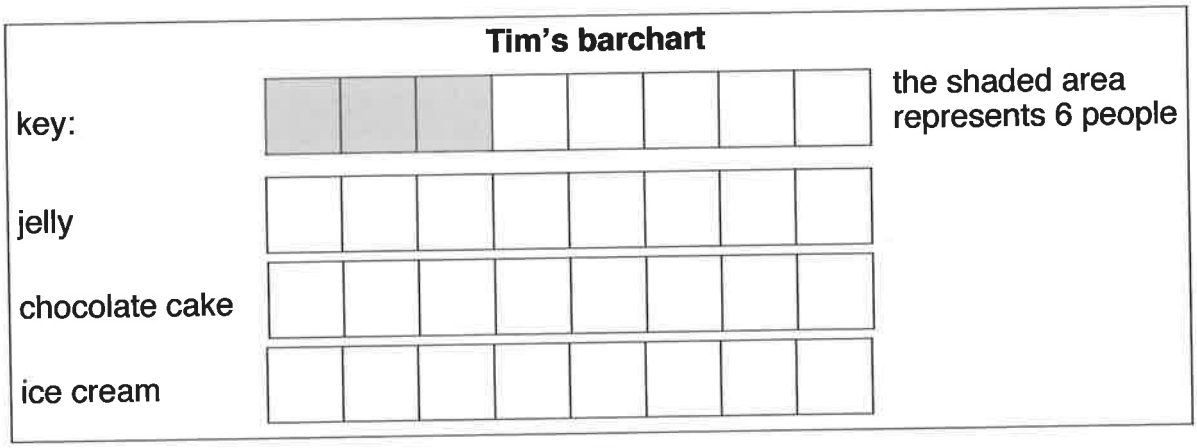
Answer: ..... (1)

(c) How many pupils are in the class?

Answer: ..... (2)

(ii) Tim records the same information on his barchart below.

Complete Tim's barchart.



(2)

10. (a) Write 100 as a product of prime factors.

Answer: ..... (3)

(b) You are given

number A = $2 \times 2 \times 2 \times 3 \times 3$

number B = $3 \times 3 \times 5 \times 5 \times 5$

(i) Which is the larger number, A or B?

Answer: ..... (1)

(ii) Write down the largest number which will divide exactly into both A and B.

Answer: ..... (1)

(iii) Which of A or B is an even number?

Answer: ..... (1)

11. (a) A number pattern is given by

37 32 27 22 ....

(i) Write down the next term in this pattern.

Answer: ..... (1)

(ii) What is the first negative number in this pattern?

Answer: ..... (2)

(b) Here is the start of another number pattern:

8.6 9.2 9.8 ....

(i) Write down the next two numbers in this pattern.

Answer: ..... and ..... (2)

(ii) Explain why 21.7 cannot be part of this number pattern.

.....

..... (1)

12. Given that $e = 4$ and $f = 2$ calculate

(i) $3f$

Answer: ..... (1)

(ii) $4e - 3f$

Answer: ..... (2)

(iii) $(e + f)^2$

Answer: ..... (2)

(iv) $\frac{ef}{e-f}$

Answer: ..... (2)

13. Solve the following equations:

(i) $c - 2 = 7$

Answer: $c =$ ..... (1)

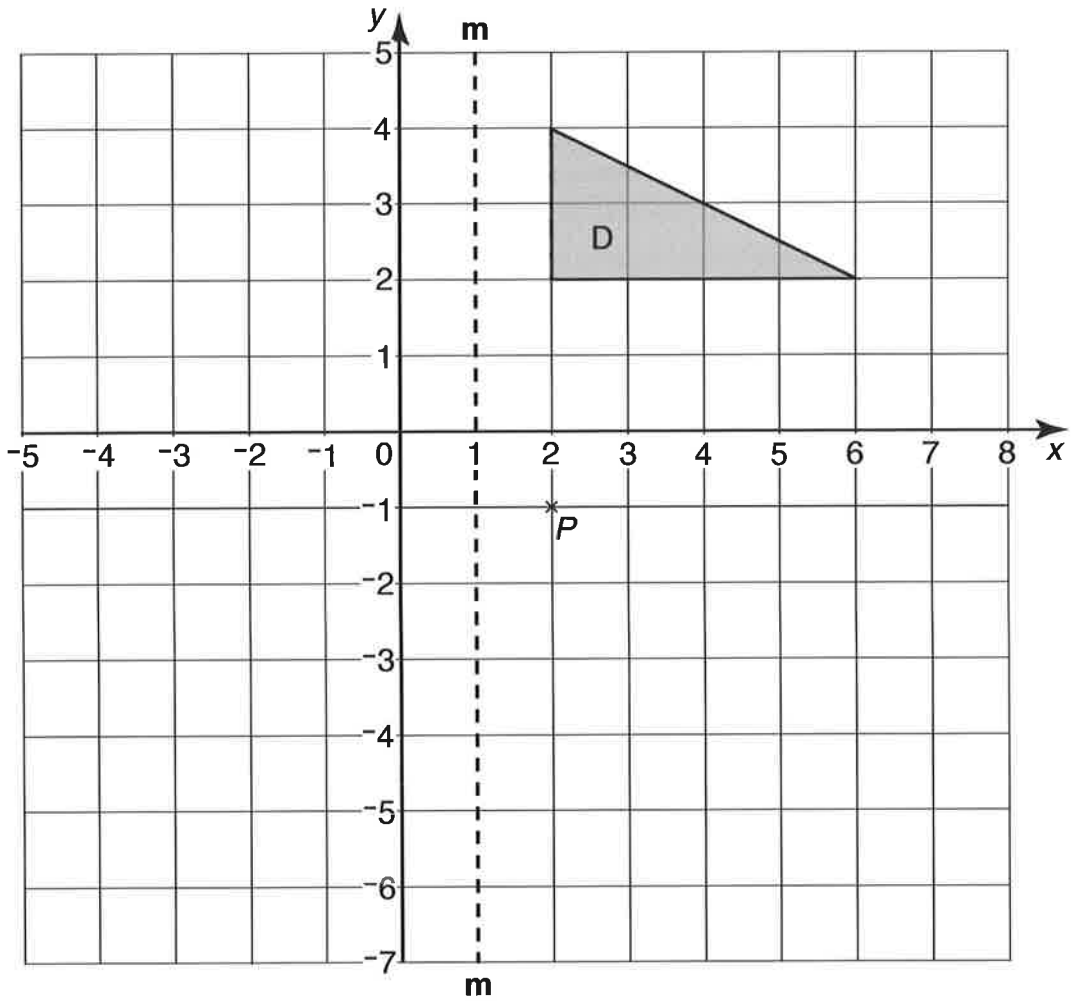
(ii) $4w = 12$

Answer: $w =$ ..... (1)

(iii) $3y + 4 = 22$

Answer: $y =$ ..... (2)

14. Triangle D is drawn on the centimetre-square grid below.



(i) (a) What is the equation for the dashed line labelled **m**?

Answer: ..... (1)

(b) Reflect triangle D in the dashed line **m** and label the new triangle E. (2)

(ii) (a) Write down the coordinates of point *P*.

Answer: (..... , ...) (1)

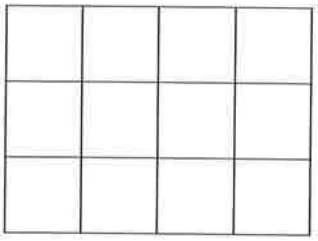
(b) Rotate triangle D through 180° about the point *P*. Label the new triangle F. (2)

(iii) Translate triangle D by *1 square right* and *2 squares down*. Label the new triangle G. (2)

(iv) Calculate the area of triangle D.

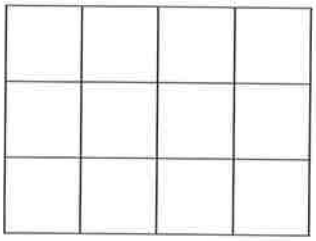
Answer: ..... cm^2 (2)

15. (a) (i) Shade in $\frac{1}{4}$ of this grid.



(1)

(ii) Shade in $\frac{2}{3}$ of this grid.



(1)

(iii) Work out $\frac{1}{4} + \frac{2}{3}$

Answer: ..... (1)

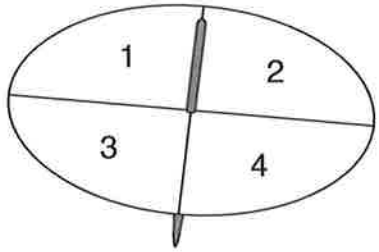
(b) Jake spends $\frac{1}{4}$ of his pocket money on a magazine.
The magazine costs £3

How much pocket money did Jake start with?

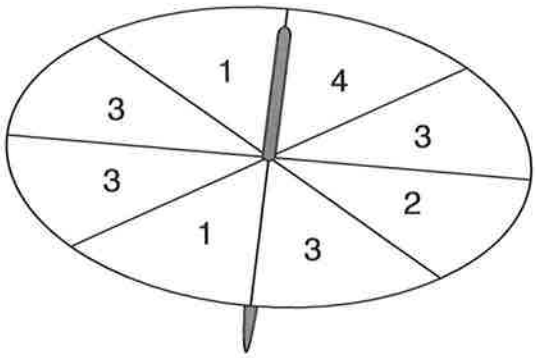
Answer: £ ..... (2)

16. (a) Katy is playing with two spinners, **A** and **B**, each divided into equal parts.

A



B



(i) Katy wins if she scores a 2. Which spinner gives her the better chance? Circle the correct statement below.

spinner **A** spinner **B** either **A** or **B** (1)

(ii) Write down a score which is equally likely on both spinners.

Answer: ..... (1)

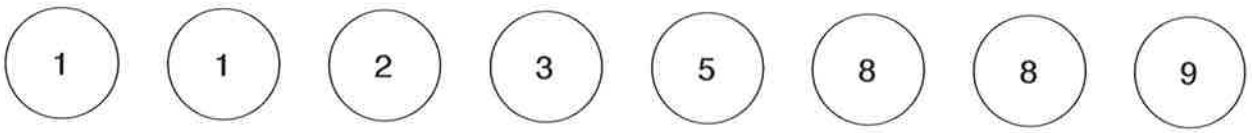
(iii) What is the most likely score on spinner **B**?

Answer: ..... (1)

(iv) Katy spins spinner **B** eight times. On how many occasions does she expect to score a 4?

Answer: ..... (1)

(b) Scott has a bag containing eight numbered counters, shown below.



He picks one counter at random from the bag.

(i) Work out the probability that the counter he picks shows an 8

Answer: ..... (1)

(ii) Work out the probability that the counter he picks shows a square number.

Answer: ..... (2)

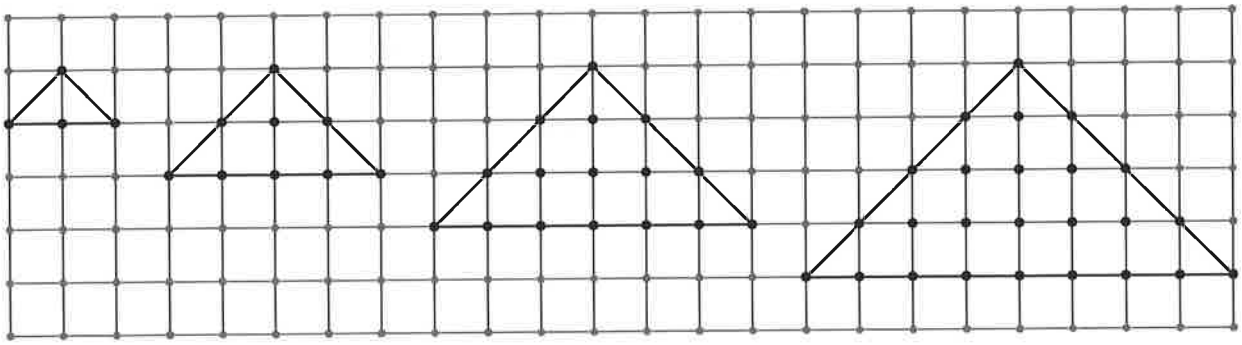
(iii) Work out the probability that he picks a counter showing a number less than 5

Answer: ..... (1)

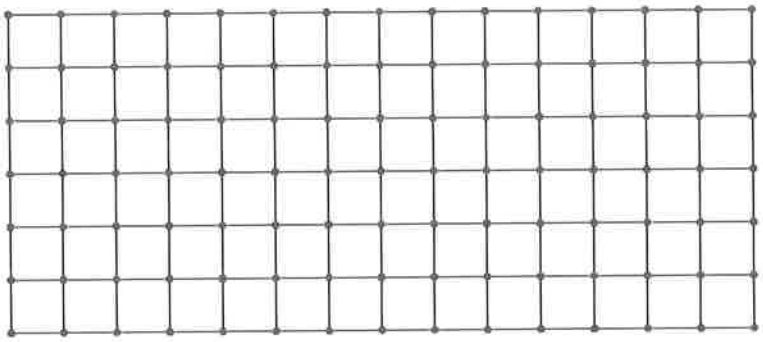
TURN OVER FOR QUESTION 17

17. Here is a series of triangles drawn on a grid:

triangle 1 triangle 2 triangle 3 triangle 4



(i) Draw triangle 5 on the grid below.



(1)

(ii) Use the diagrams to complete the table below.

triangle number	1	2	3	4	5
number of dots on the perimeter of the triangle	4	8	12		
number of dots completely inside the triangle	0	1			
total number of dots	4	9			

(3)

(iii) Work out

(a) the number of dots on the perimeter of triangle 7

Answer: ..... (1)

(b) the total number of dots for triangle 7

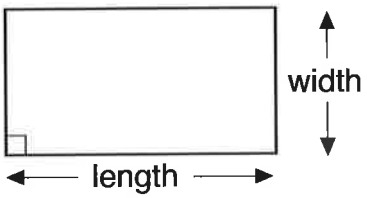
Answer: ..... (2)

(Total marks: 100)

Formula Sheet

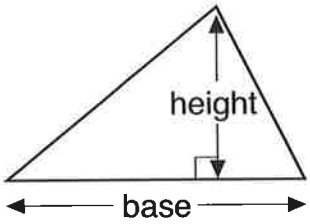
area

rectangle



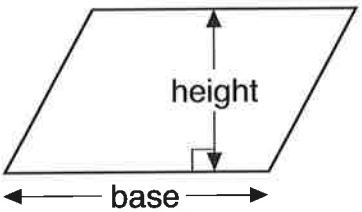
area rectangle = length × width

triangle



area triangle = $\frac{1}{2}$ × base × height

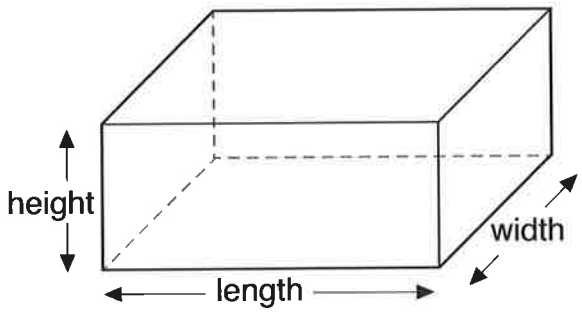
parallelogram



area parallelogram = base × height

volume

cuboid



volume cuboid = length × width × height