ISEB

Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 11+

MATHEMATICS

Practice Paper 2008–2009

Please read this information before the examination starts.

- This examination is 60 minutes long.
- Please try **all** the questions.
- Write your answers on the dotted lines.
- All working should be written on the paper.
- Tracing paper may be used.
- Calculators are not allowed.

1. (a) Write in figures the number

    (i) eleven thousand and nine

    Answer: .... (1)

    (ii) which is 10 less than 903

    Answer: .... (1)

    (iii) which is half of 260

    Answer: .... (1)

    (b) Kelly arranges some number cards to make the number 2651 as shown.

    | 2 | 6 | 5 | 1 |

    (i) What is the value of the 2 in this number?

    Answer: .... (1)

    (ii) Rearrange the 4 cards to make the smallest number possible.

    Answer: ☐ ☐ ☐ ☐ (1)

2. Here is the start of a number pattern:

   1　　**4**　　**7**　　**10**　　**13**　　**16**　　**...**

   (i) From the numbers in the list above, write down

   (a) a factor of 8

   Answer: .... (1)

   (b) the product of 2 and 5

   Answer: .... (1)

   (c) a prime number

   Answer: .... (1)

   (ii) Write down the next 2 numbers in the pattern.

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

   (iii) What is the largest number in the pattern which is less than 40?

   Answer: .... (2)

3. Alex enjoys taking photographs.

He takes 86 photographs on Monday and 58 photographs on Tuesday.

(i) How many photographs does he take altogether?

Answer: .... (2)

Alex puts his photographs in an album.

6 photographs fit on each page.

(ii) How many pages does he use?

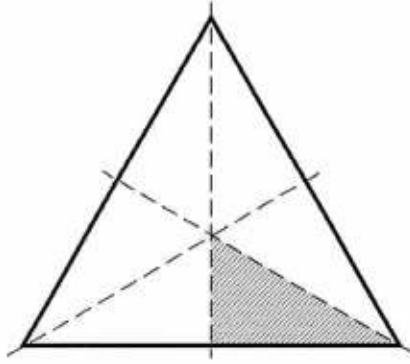Answer: .... (2)

An enlargement costs £2.65

Alex buys 7 enlargements.

(iii) (a) How much do his enlargements cost in total?

Answer: £ .... (2)

Alex pays with a £20 note.

(b) How much change does he get?

Answer: £ .... (2)

4. 3 lines of symmetry have been drawn on this equilateral triangle, dividing it into sections. One section has been shaded.

    (i) What fraction of the triangle has been shaded?

                        Answer: .... (1)

    (ii) Shade in a further $\frac{1}{3}$ of the triangle. (1)

    (iii) What fraction of the triangle is now not shaded?
          Give your answer in its simplest form.

                        Answer: .... (1)

5.   **18.7**   **18.67**   **20.3**   **20.27**   **18.706**

    (i) Write down the largest number from the list above.

                        Answer: .... (1)
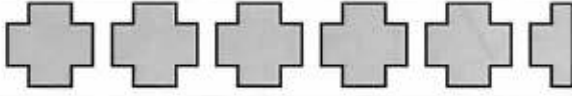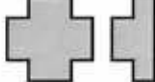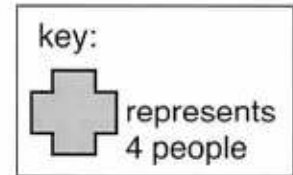
    (ii) Write down the smallest number from the list above.

                        Answer: .... (1)

    (iii) Calculate the difference between the largest and the smallest numbers in the list.

                        Answer: .... (2)

6. This pictogram shows how many people were treated for sports injuries at a clinic last week.

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

key:

represents 4 people

(i) How many people were treated on Monday?

Answer: .... (1)

(ii) How many people does ⌐| represent?

Answer: .... (1)

(iii) Draw the symbol which would be used to represent 1 person.

Answer: .... (1)

9 people were treated on Friday.

(iv) Add this information to the pictogram. (1)

(v) Calculate the total number of people who were treated last week.

Answer: .... (3)

(vi) Calculate the mean number of people treated each day.

Answer: .... (2)

7. 6 dogs were weighed, and then one year later they were weighed again.
A weight gain is shown as a positive number and a loss is shown as a negative number.
For example −3 means that the dog lost 3 kilograms in weight.

dog name	weight change, in kg
Rex	+1
Sam	−2
Troy	+2
Walker	0
Yogi	−3
Zig	−1

(i) How many dogs stayed the same weight?

Answer: .... (1)

(ii) Which dog gained the most weight?

Answer: .... (1)

(iii) Which dog lost more weight than Sam?

Answer: .... (1)

8. 3 points have been plotted and joined on the centimetre grid below.
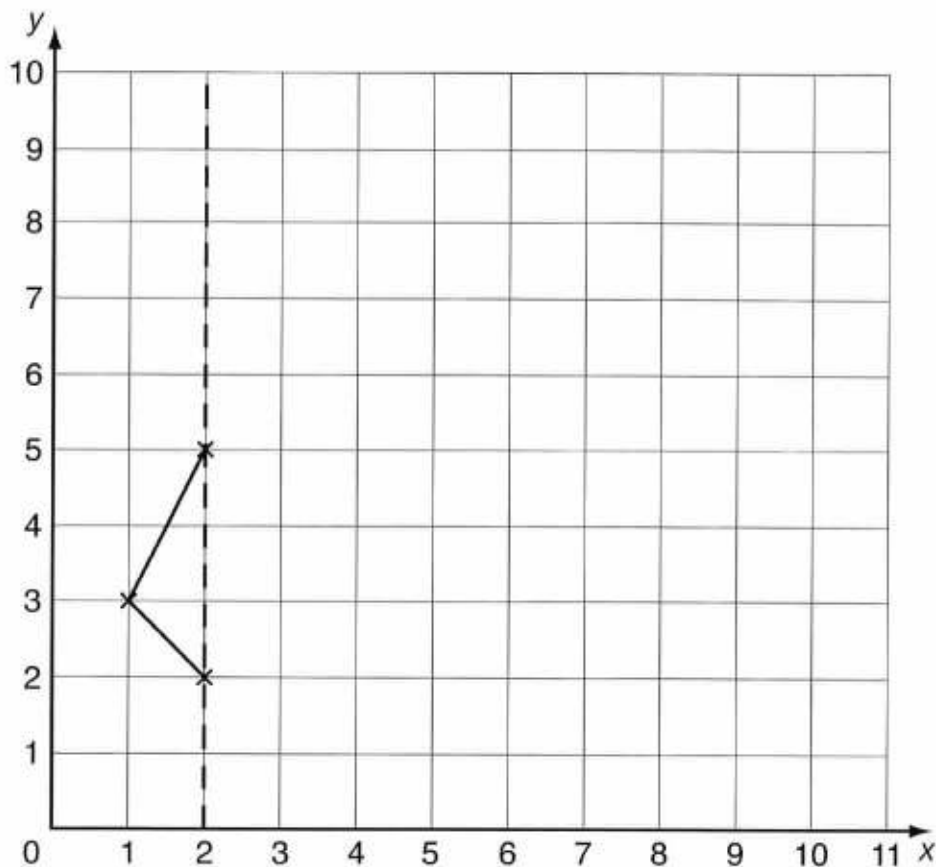
(i) Reflect the pattern in the dashed line to complete the shape.
Label the shape **A**. (1)

(ii) Write down the special name of shape **A**.

Answer: .... (1)

(iii) What is the area of shape **A**?

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

(iv) Translate shape **A** *4 squares right* and *2 squares up*.
Label your shape **B**. (2)
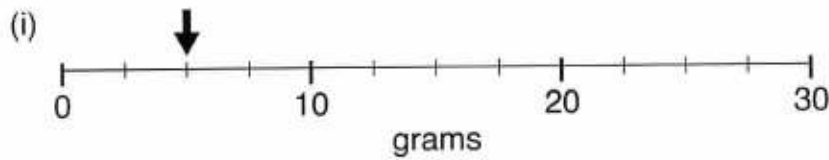
(v) Rotate shape **A** 180° about the point (3,3).
Label your shape **C**. (2)

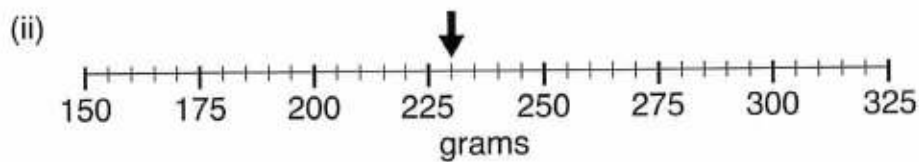9. (a) Choose one of the following units to complete each statement below.

km   **m**   **cm**   **mm**   **ℓ**   **mℓ**

- Mandy's thumb is approximately 50 .... long.

- A glass could contain 250 .... of orange juice.

- A house could be 7.5 .... tall.   (3)

(b) Write down, in grams, the masses represented by the arrows on these scales.

(i)

grams

Answer: .... g (1)

(ii)

grams

Answer: .... g (1)

(iii)
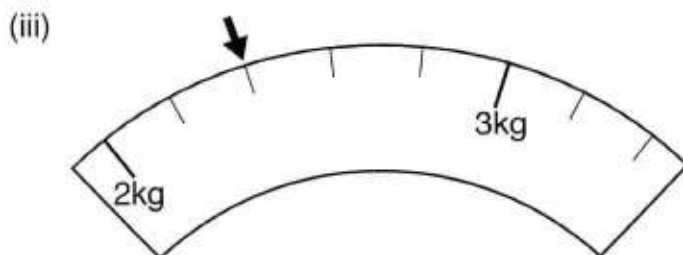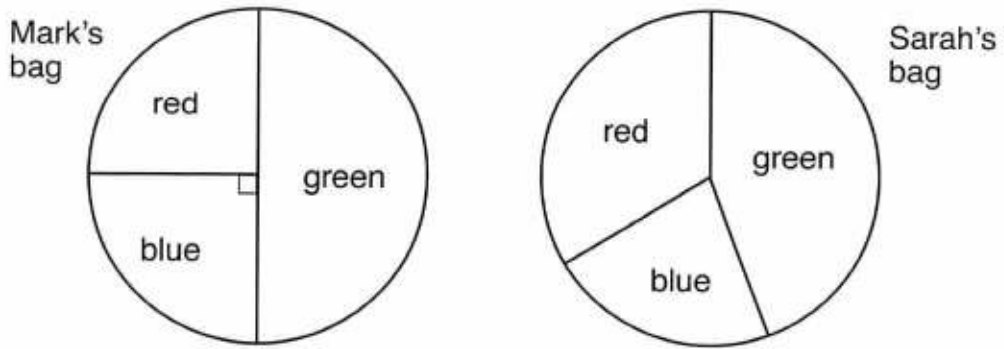

Answer: .... g (2)

10. Mark and Sarah each has a bag of coloured counters.

These pie charts show the proportion of each colour in their bags.

(i) What percentage of Mark's counters are blue?

Answer: .... % (1)

Mark has 40 counters in his bag.

(ii) How many of his counters are not blue?

Answer: .... (2)

$\frac{1}{3}$ of Sarah's counters are red, and the rest are green or blue.

(iii) Given that Sarah has 12 red counters, how many counters are there altogether in her bag?

Answer: .... (1)

(iv) Sarah has twice as many green counters as blue ones.
How many blue counters does she have?

Answer: .... (2)
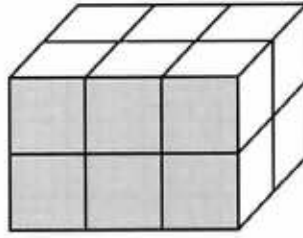
They each pick one counter at random from their own bag.

(v) Who is more likely to pick a green counter?

Answer: .... (1)
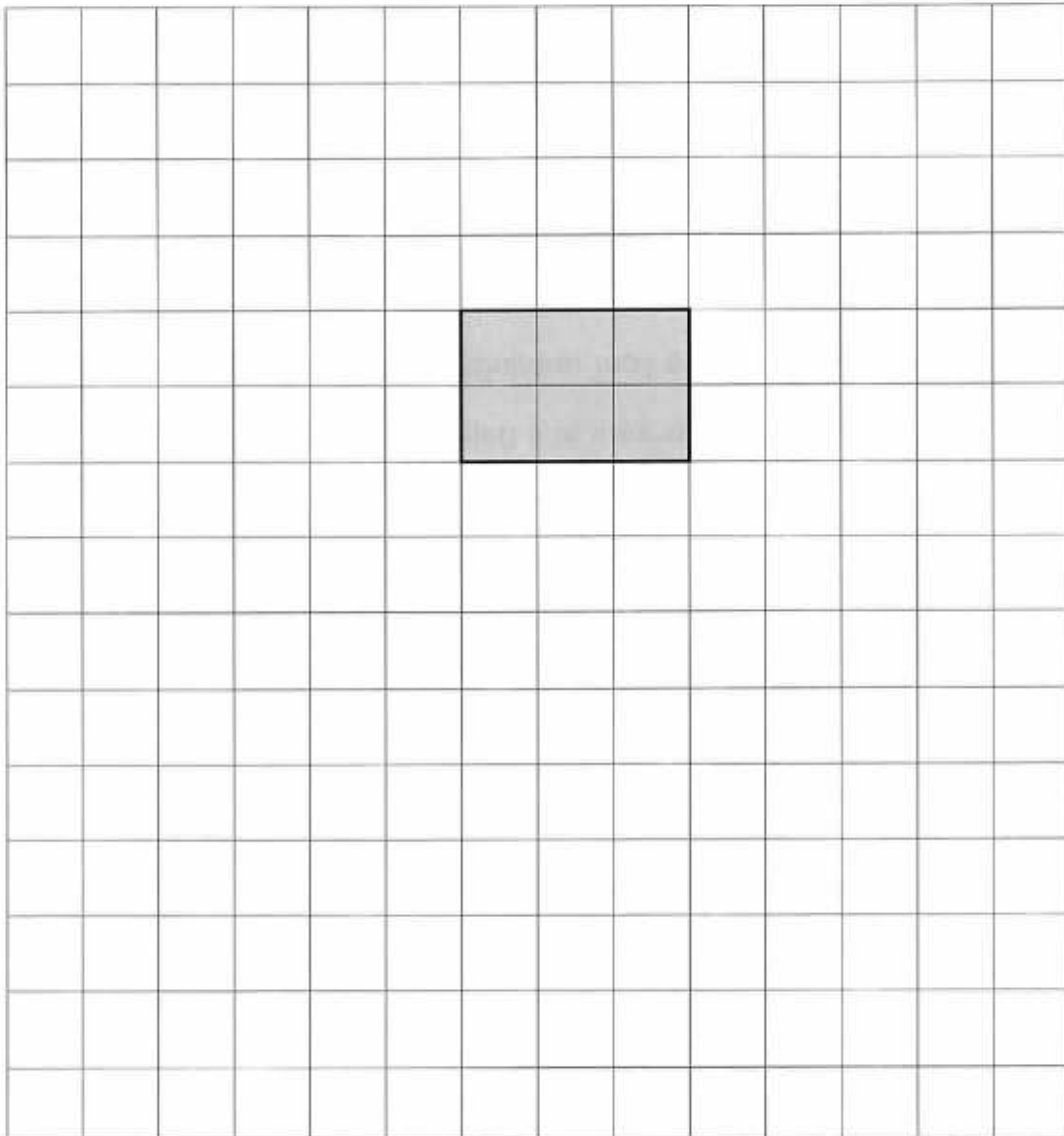
11. This small box measures 2 cm by 2 cm by 3 cm.

(i) Calculate the volume of the box.

Answer: .... cm³ (2)
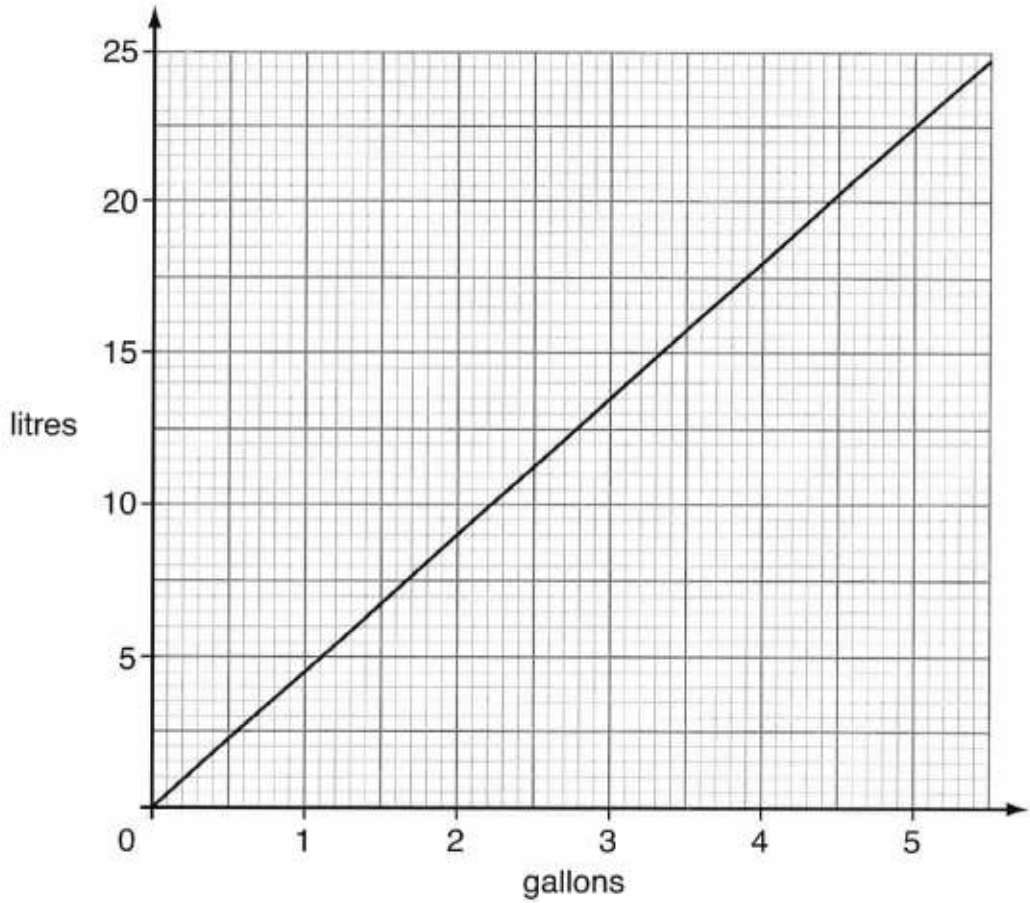
(ii) On the centimetre squared grid below, draw a net for the box.
(The shaded face has already been drawn for you.)

(3)

12. Here is a graph to convert between gallons and litres:

(i) Showing clearly how you take your readings, use your graph to find

(a) how many litres are equivalent to 4 gallons

Answer: .... litres   (1)

(b) how many litres are equivalent to 1.8 gallons

Answer: .... litres   (1)

(c) how many gallons are equivalent to 10 litres

Answer: .... gallons   (1)

(ii) One day, Julie's Juice Bar sells 1000 litres of orange juice.

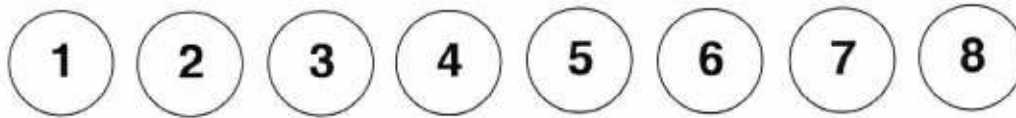(a) Use your answer to part (i) (c) to write 1000 litres as gallons.

Answer: .... gallons (2)

It takes 13 oranges to make 1 litre of juice.

(b) How many oranges are needed to make 25 litres of juice?

Answer: .... (2)

13. Mr Prime has these numbered discs face down on a table:

$$ \textbf{1} \quad \textbf{2} \quad \textbf{3} \quad \textbf{4} \quad \textbf{5} \quad \textbf{6} \quad \textbf{7} \quad \textbf{8} $$
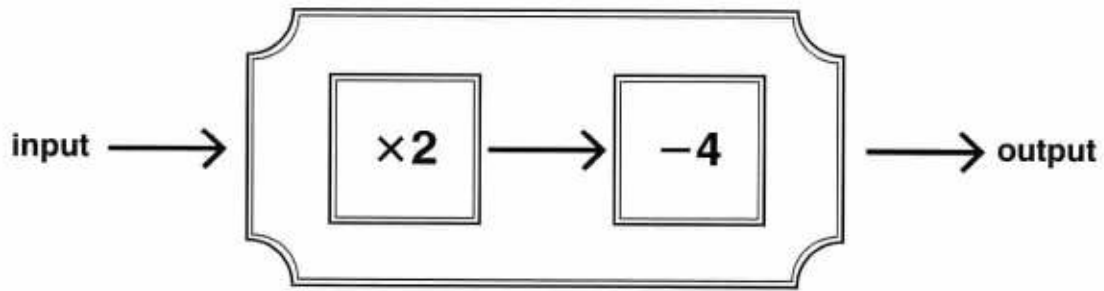
He turns one over at random.
On the line below, mark the following probabilities with the letters shown:

A   the number on his disc is a square number

B   the number on his disc is a prime number

C   the number on his disc is a multiple of 12

impossible   even   certain
                              chance
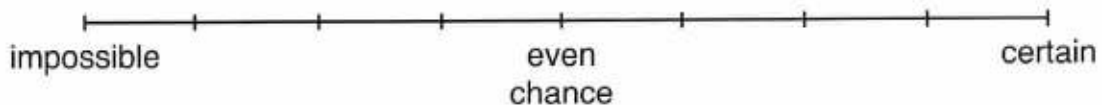
(3)

14. (a) The number machine below changes numbers according to the rule **multiply by 2 and then subtract 4**

input ⟶ [×2 ⟶ −4] ⟶ output

(i) Write the missing input and output numbers for this machine.

	input	×2 then −4	output
Example	6	⟶	8
	8	⟶	....
	11	⟶	....
	....	⟶	22
	....	⟶	0

(4)

(ii) There is one number which does not change when you put it in the number machine.

What is the number?

Answer: .... (2)
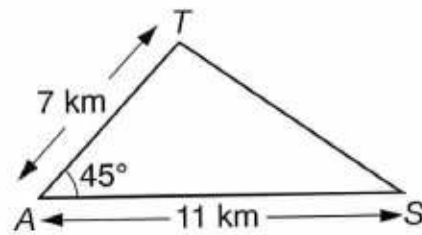
(b) I think of a number, add 1 and then divide by 2

The result is 7

What is the number which I am thinking of?

Answer: .... (2)

15. This is a sketch showing the position of three towns, Addbridge (A), Sumville (S) and Totalton (T).

not to scale

(i) Using a scale of 1 centimetre to represent 1 kilometre, how many centimetres would represent 11 kilometres?

Answer: .... cm   (1)

(ii) Draw accurately the triangle AST, using a scale of 1 centimetre to represent 1 kilometre.

(The point A is already drawn for you.)

(3)

(iii) Measure and write down the obtuse angle at T.

Answer: .... °   (1)

(iv) Use a compass direction to complete the sentence.

Addbridge is .... of Totalton.   (1)

16. (a) Find the median and mode of these numbers:

6   2   5   13   5   10   9

Answer: median is ....

mode is .... (2)

(b) Three children have a median age of 10 and the range of their ages is 5

(i) What is their median age exactly 1 year later?

Answer: .... (1)

(ii) What is the range of their ages exactly 1 year later?

Answer: .... (1)

(c) Two numbers have a mean of 12 and a range of 6
What are the two numbers?

Answer: .... and .... (2) ▮

(d) A set of five numbers has a mean of 7, a median of 6 and a mode of 5

(i) Write down a possible set of five numbers.

Answer: ...., ..., ..., ..., ... (3)

(ii) Write down another possible set of five numbers.

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

(Total marks: 100)