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.

   \[
   \begin{array}{cccc}
   2 & 6 & 5 & 1 \\
   \end{array}
   \]

(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:

\[ \begin{array}{ccccccc}
  1 & 4 & 7 & 10 & 13 & 16 & \ldots \\
\end{array} \]

(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.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Monday</td>
<td></td>
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<tr>
<td>Tuesday</td>
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<td>Wednesday</td>
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<td></td>
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<tr>
<td>Thursday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(i) How many people were treated on Monday?

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

(ii) How many people does \( \square \) 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.

(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.

<table>
<thead>
<tr>
<th>dog name</th>
<th>weight change, in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rex</td>
<td>+1</td>
</tr>
<tr>
<td>Sam</td>
<td>–2</td>
</tr>
<tr>
<td>Troy</td>
<td>+2</td>
</tr>
<tr>
<td>Walker</td>
<td>0</td>
</tr>
<tr>
<td>Yogi</td>
<td>–3</td>
</tr>
<tr>
<td>Zig</td>
<td>–1</td>
</tr>
</tbody>
</table>

(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: .................................................. cm² (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.

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

(i)

Answer: ................................................. g (1)

(ii)

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.)
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:

1 2 3 4 5 6 7 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 chance certain

(3)
14. (a) The number machine below changes numbers according to the rule **multiply by 2 and then subtract 4**

![Diagram of the number machine with input, output, and operations: \( \times 2 \rightarrow -4 \)]

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

<table>
<thead>
<tr>
<th>input</th>
<th>( \times 2 ) then ( -4 )</th>
<th>output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example 6</td>
<td>[\text{---------}]</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>[\text{---------}]</td>
<td>[\text{--------}]</td>
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<tr>
<td>11</td>
<td>[\text{---------}]</td>
<td>[\text{--------}]</td>
</tr>
<tr>
<td>[\text{--------}]</td>
<td>[\text{---------}]</td>
<td>22</td>
</tr>
<tr>
<td>[\text{--------}]</td>
<td>[\text{---------}]</td>
<td>0</td>
</tr>
</tbody>
</table>

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

What is the number?

Answer: \[\text{------------------------------------------------------------------------}\] (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: \[\text{------------------------------------------------------------------------}\] (2)
15. This is a sketch showing the position of three towns, Addbridge \((A)\), Sumville \((S)\) and Totalton \((T)\).

\(\text{not to scale}\)

\(\text{\(7\) km}\)

\(\text{\(45^\circ\)}\)

\(\text{\(11\) km}\)

(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.

\((The\ point\ A\ is\ already\ drawn\ for\ you.)\)

(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)