COMMON ENTRANCE EXAMINATION AT 11+

MATHEMATICS

Specimen Paper

(for first examination in Autumn 2016)

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.
- Fraction answers should be given in their simplest form.
1. Write down the answers to these questions. 
   *(You may work them out in your head.)*

   (i) $48 + 35$
   
   Answer: ....................................  (1)

   (ii) $613 - 123$
   
   Answer: ....................................  (1)

   (iii) $28 \div 4$
   
   Answer: ....................................  (1)

   (iv) $2^3$
   
   Answer: ....................................  (1)

   (v) twenty-five percent of eighty
   
   Answer: ....................................  (1)

   (vi) $6.3 \times 100$
   
   Answer: ....................................  (1)

   (vii) $398 + 297$
   
   Answer: ....................................  (1)

   (viii) $27 \times 5$
   
   Answer: ....................................  (1)
2. (a) Write down all the prime numbers between 10 and 20

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

(b) Write down the first three multiples of 12

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

(c) Write down all the factors of 16

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

3. A box of 7 grapefruit costs £3.29

(i) What is the cost of one grapefruit? Give your answer in pence.

Answer: ................................. p (2)

Patrick buys 2 boxes of grapefruit and pays with a £20 note.

(ii) How much change should he receive?

Answer: £ ................................. (2)
4. These thermometers show the temperatures inside and outside a window at 10 a.m. one winter's day.

(i) How many degrees warmer was it inside than outside the window?

Answer: ................................ °C (1)

At 10 p.m., the temperature outside had fallen by 2 °C.

(ii) What was the temperature outside the window at 10 p.m.?

Answer: ................................ °C (1)

5. Fill in the boxes to make the following statements true.

(i) $8 + 4 \times \boxed{} = 36$

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

(ii) $5 \times (4 - \boxed{}) = 15$

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

(iii) $10 - (5 + \boxed{}) = -3$

Answer: ................................ (1)
6. Shape $\text{P}$ is drawn on the centimetre-square grid below.

(i) Reflect shape $\text{P}$ in the dashed line.
   Label the new shape $\text{Q}$.  
   \hspace{2cm} (2)

(ii) Translate shape $\text{P}$ 3 units right and 4 units up.
   Label the new shape $\text{R}$.  \hspace{2cm} (2)

(iii) Work out the area of shape $\text{P}$.
   Give your answer with the correct units.
   Answer: .................................... \hspace{2cm} (2)

7. (a) Write down the value of these Roman numerals.
   (i) $\text{V}$
       Answer: .................................... \hspace{2cm} (1)

   (ii) $\text{M}$
       Answer: .................................... \hspace{2cm} (1)

(b) Which year is written in Roman numerals as MMXVII?
   Answer: .................................... \hspace{2cm} (1)
8. (a) Work out the following.

(i) 3579 + 1824

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

(ii) 3579 − 1824

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

(iii) 264 × 27

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

(iv) 1595 ÷ 11

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

(b) Round 2089 to the nearest 100

Answer: ....................................  (1)
9. Calculate the mean of these numbers.

\[ 9 \quad 14 \quad 7 \quad 17 \quad 8 \]

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

10. Here is a list of fractions:

\[ \frac{3}{4} \quad \frac{5}{8} \quad \frac{15}{11} \quad \frac{8}{12} \quad \frac{4}{5} \]

Choose from the list

(i) a fraction which is greater than 1

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

(ii) a fraction equivalent to 80%

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

(iii) a fraction equivalent to 0.75

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

(iv) a fraction which is not in its simplest form

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

11. A sunflower is 150 cm tall.

How tall will it be if its height increases by 10%?

Answer: .............................. cm  (2)
12. Here are 5 number cards: 

The cards can be put together to form numbers. 
For example, the smallest number which could be made using 4 of the cards is:

3 5 6 7

(i) Using all 5 cards 
(a) what is the largest possible even number?

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

(b) what is the number which is closest to 80000?

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

(ii) Use exactly 2 of the cards to make the smallest possible prime number.

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

(iii) Arrange any 4 of the cards to show a sum below which will give the smallest possible answer.

Answer: .................................... (1)
13. Put these distances in order from smallest to largest.

<p>| | | | |</p>
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<tr>
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<tr>
<td>27.8 km</td>
<td>2.087 km</td>
<td>2778 m</td>
<td>2.708 km</td>
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Answer: ........................................, ........................................, ........................................, ........................................ (3)

smallest

largest

14. (i) Draw accurately triangle $ABC$ where $AB = 5.5$ cm, angle $A = 45^\circ$ and angle $B = 90^\circ$

(Point $A$ is already drawn for you.)

(ii) Measure and write down the length of side $BC$.

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

(iii) equilateral  isosceles  scalene  right-angled

Circle any appropriate words from the box above to describe triangle $ABC$.

Give reasons for your answer.

.................................................................................................................................

.................................................................................................................................. (2)
15. (i) Two identical rectangles are divided into 15 equal squares.

(a) Shade $\frac{3}{5}$ of this rectangle:

```
  1  2  3  4  5
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(b) Shade $\frac{2}{3}$ of this rectangle:

```
  1  2  3  4  5
```

(c) Which is larger: $\frac{3}{5}$ or $\frac{2}{3}$.

Give a reason for your answer.

Answer: ......................... because ..........................................................

..................................................................................................................

.................................................................................................................. (2)

(ii) Arrange these fractions in order from smallest to largest.

\[
\frac{1}{3}, \quad \frac{2}{3}, \quad \frac{4}{5}, \quad \frac{13}{15}, \quad \frac{3}{5}
\]

Answer: ........................., ........................., ........................., ........................., ......................... (2)
16. Work out
   (i) \( \frac{2}{3} - \frac{1}{6} \)

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

   (ii) \( \frac{2}{5} \times 3 \)

Write your answer as a mixed number.
(You may use the diagrams to help you.)

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

17. In a box of 24 pens, one eighth are green, 25\% are red and the rest are blue.

What fraction of the pens is blue?

Answer: .................................... (3)
18. (a) Jake hangs a peg basket on a washing line.

Find the size of one of the shaded angles in the diagram above, if both are the same size.

Answer: ................................° (2)

(b) The diagram below shows two straight lines.

Find the sizes of the angles marked $a$, $b$ and $c$.

Answer: $a =$ ................................°

Answer: $b =$ ................................°

Answer: $c =$ ................................° (3)
19. Sarah measured the temperature of a beaker of liquid every 10 minutes during a science experiment.

She plotted her results on the graph below.

(i) What was the lowest temperature of the beaker?

Answer: ……………………………….. °C  (1)

(ii) At what time was the temperature of the beaker 15 °C?

Answer: ………………………………..  (1)

Sarah measured the temperature of the beaker again 4 hours and 30 minutes after the last reading on the graph.

(iii) At what time did she take this measurement?

Answer: ………………………………..  (1)
20. Farmer Jack and Farmer Giles each have a rectangular field.

Farmer Jack’s field has an area of $24 \text{ m}^2$. Its length is $8 \text{ m}$.

(i) Work out the width of Farmer Jack’s field.

Answer: $\ldots \ldots \ldots \ldots \text{m}$ (2)

(ii) Work out the perimeter of Farmer Jack’s field.

Answer: $\ldots \ldots \ldots \ldots \text{m}$ (2)

Farmer Giles’ field has a perimeter of $20 \text{ m}$. The width of Farmer Giles’ field is $4 \text{ m}$.

(iii) Work out the length of Farmer Giles’ field.

Answer: $\ldots \ldots \ldots \ldots \text{m}$ (2)

(iv) Work out the area of Farmer Giles’ field.

Answer: $\ldots \ldots \ldots \ldots \text{m}^2$ (1)
Farmer Josephine also has a rectangular field.

\[
\begin{array}{|c|c|}
\hline
x \text{ m} & \text{Farmer Josephine’s field} \\
\hline
y \text{ m} & \text{not to scale} \\
\hline
\end{array}
\]

The width of Farmer Josephine’s field is \(x\) m and the length is \(y\) m.
Farmer Josephine builds a fence along the perimeter of her field.

(v) If the total length of this fence is 30 m, write down two possible values of \(x\) and \(y\).

Answer: \(x = \ldots\ldots\ldots\ldots\ldots\) m and \(y = \ldots\ldots\ldots\ldots\ldots\) m

or \(x = \ldots\ldots\ldots\ldots\ldots\) m and \(y = \ldots\ldots\ldots\ldots\ldots\) m (2)

21. Sanjay is making purple paint.

\[\text{purple paint}
\text{mix 2 litres of red paint for every 3 litres of blue paint}\]

(i) If he uses 6 litres of red paint, how much blue paint should he use?

Answer: \(\ldots\ldots\ldots\ldots\ldots\) litres (1)

(ii) How much blue paint is needed to make 35 litres of purple paint?

Answer: \(\ldots\ldots\ldots\ldots\ldots\) litres (2)
22. (a) Annie and Bradley each think of a number.
   The difference between their numbers is 6
   The sum of their numbers is 20

   What are the two numbers?

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

(b) Alice thinks of a number.
   Alice calls her number $a$.

   **Alice adds 7 to her number, and then doubles her answer.**

   Write an expression, using $a$, to show what Alice does.

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

(c) Jack thinks of a number.
   Jack calls his number $n$.

   **Jack multiplies his number by 3, and then subtracts 5**

   He gets the answer 16

   Use this information to write down an equation, and then solve it to find $n$.

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

(Total: 100 marks)