OUNDLE

School

Non Common Entrance Examination 2013
Third Form Entry

Mathematics

Section A: 30 minutes   **No calculators allowed**

- Write ALL your working and answers on this paper. Show enough working on each question to make it clear how you reached your answer. **Underline your answers.**

- Do not spend too long working on any particular question. Do not worry if you do not manage to complete every question in each section.

- You may work in pen or pencil.

Section A   NO CALCULATORS

1.   Work out:

   (a) $6.91 + 39.5$

   (b) 68×39

   (c) 6000×1.2

   (d) 0.12×0.8

   (e) $1169.6 \div 8$

   (f) $14 + 8 \div 2 - 2 \times 5$

   (g) 80% of 80

(h) $\dfrac{7}{12} + \dfrac{3}{8}$

(i) $4\dfrac{1}{6} \div 1\dfrac{2}{3}$

2.   If $a = 3$, $b = -5$, and $c = -2$, find the value of the following expressions:

(a) ab

(b) b^2

(c) $2a + b - c$

3.   Find the value of x in the following equations:

(a) $3x + 17 = 50$

(b) $3x + 4(x - 3) = 37$

(c) $2x^2 = 72$

(d) $5x - 4 = 3x + 8$

4.   Complete the following table:

Fraction (in its simplest form)	Percentage	Decimal
$\dfrac{1}{5}$		0.2
	65%	
$1\dfrac{3}{4}$		
		0.003

5.   My train was scheduled to leave at 16:20 and to arrive at 17:05.
However, it left 6 minutes late and the journey took 3 minutes less than it was scheduled to. What time did I arrive?

6.   Fill in the next three terms of the following sequences:

(a)   4, 7, 10, 13, ...

(b)   95, 87, 79, 71, ...

(c)   32, 16, 8, 4, ...

(d)   2, 3, 5, 7, 11, ...

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Name:

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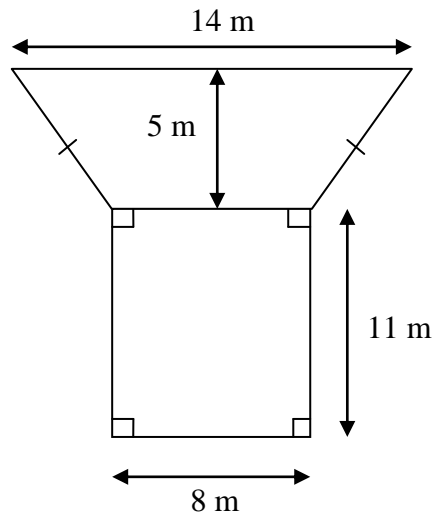Third Form Entry

Mathematics

Section B: 30 minutes   **Calculators may be used**

- Write ALL your working and answers on this paper. Show enough working on each question to make it clear how you reached your answer. **Underline your answers.**

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- You may work in pen or pencil.

Section B You may use a calculator for this section.

7.   (a)   Name the two shapes in the diagram below: .... and ....

      (b)   Find the area of the shape below (which is not drawn to scale):

```
                    14 m
        ┌─────────────────────────┐
         \                       /
          \        5 m          /
           \        ↕          /
            ┌──────────────────┐
            │                  │  ↕
            │                  │
            │        8 m       │  11 m
            └──────────────────┘
```

8.   The sizes of the first eleven pairs of shoes sold in a shop one morning are

      6   4   8   6   9   12   8   7   11   3   6

      (a)   What is the mode of the data?

      (b)   What is the median shoe size?

      (c)   Calculate the mean of the data? (to 2 decimal places)

      (d)   Which is the most useful value to the shopkeeper, the mode or the median?
             Explain your reasoning.

9. A chocolate cake recipe contains several ingredients, including cocoa powder and butter.
All the ingredients used together weigh 580g.
The ratio of cocoa : butter : other ingredients is 1 : 3 : 16.

   (a) How much butter is in the cake?

   (b) If there is 261g of flour in the cake, what is the ratio of flour to butter?

10. (a) If I score 38 out of 75 in a Chemistry test, what percentage did I score?
Give your answer correct to one decimal place.

   (b) Decrease £820 by 12.5%.

   (c) If my weight increased from 67 kg to 71.5 kg, what is the percentage increase?
Give your answer correct to one decimal place.

11. A model car travels 1800 m in 36 minutes.

   How long would it take to travel 1 km?

12. If m and n are prime numbers, and

$m^2 n^3 = 108$

Find the values of m and n.

13. A factorial (which has a symbol !) can be defined as follows:

$6! = 6 \times 5 \times 4 \times 3 \times 2 \times 1$

$10! = 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$

Work out the following:

(a) $5!$

(b) $6! - 5!$

(c) $\dfrac{8!}{6!}$

(d) $\dfrac{100!}{99!2!}$

(e) $\dfrac{(x+1)!}{x!}$

THE END