Name:

Non Common Entrance Examination 2014
Fourth 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.

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

You may work in pen or pencil.

Section A NO CALCULATORS

1. Work out the following

(a) 8.76 + 24.5

Answer .....

(b) 48 × 72

Answer .....

(c) 4300 × 2.4

Answer .....

(d) 0.71 × 0.03

Answer .....

(e) 122.58 ÷ 9

Answer .....

(f) 18 + 7 ÷ 2 – 4 × 7

Answer .....

(g) 82% of 90

Answer .....

2. Work out

(a) $\frac{3}{4}+\frac{7}{10}$

Answer .....

(b) $6\frac{1}{4} \div 2\frac{1}{5}$

Answer .....

3. If $a = 4$, $b = -5$ and $c = -2$, find the value of the following expressions

(a) ab

Answer .....

(b) b^2

Answer .....

(c) $4a - b + 2c$

Answer .....

4. Find the value of x in the following equations

(a) $3x + 23 = 71$

Answer .....

(b) $5x - 2(x + 2) = 17$

Answer .....

(c) $2x^2 = 288$

Answer .....

(d) $0.5x + 18 = 0.75x$

Answer .....

5. Simplify these expressions, removing the brackets where appropriate

(a) $3(8 - x)$

Answer .....

(b) $p^3qr^2 \times pq^2r$

Answer .....

(c) $\dfrac{111x^2y^4}{37xy^5z}$

Answer .....

(d) $27 - 5(x - 8)$

Answer .....

6. Factorise these expressions completely

(a) $5x - 13x^2$

Answer .....

(b) $21y^2 + 77xy$

Answer .....

(c) $x^2 - 3x + 2$

Answer .....

(d) $3x^2 + 5x + 2$

Answer .....

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Section B : 30 minutes **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.

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You may work in pen or pencil.

Section B You may use a calculator for this section.

7. In a large box of 143 sweets there are just cola cubes and bonbons. If there are 7 cola cubes for every 4 bonbons, how many bonbons are there?

Answer ……

8. (a) What is the average (mean) of the numbers below:

4.8 7.4 3.6 85.3 13.9

Answer ……

(b) Find five numbers that have a mean of 4, a median of 5 and a mode of 1.

Answer ……

9. There are 40 people in a room. They shake each other's hands once and only once. How many handshakes are there altogether?

Answer ……

10. Place the numbers 2, 3, 4 and 8 in the gaps below to make the statement true.
(Each number should be used once *only)*

…… + …… × …… − …… = 22

11. $1^2 = 1$, $2^2 = 4$, $3^2 = 9$ etc are square numbers. Bachet's Theorem says that any number can be made by adding together up to four square numbers.

Find square numbers that add up to the following numbers *(remember not to use more than four!)*

(a) 17

Answer .....

(b) 35

Answer .....

(c) 76

Answer .....

(d) 156

Answer .....

12. 777 is a number whose digits add up to 21. How many numbers are there between 0 and 1000 inclusive, whose digits add up to 21?

Answer .....

13. The "floor" of a number, x, is the greatest integer less than or equal to x. It is written as $\lfloor x \rfloor$.
For example, $\lfloor 6.8 \rfloor = 6$, $\lfloor -3.2 \rfloor = -4$ and $\lfloor 5 \rfloor = 5$.

Find

(a) (i) $4\left(3+\lfloor 7.5 \rfloor\right)$

Answer .....

(ii) $\lfloor -5 \times 10 \div 13 \rfloor$

Answer .....

(b) Find all possible solutions to the equation

$$\lfloor x \rfloor = 2x$$

Answer .....