Name:

OUNDLE
School

Non Common Entrance Examination 2013
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. **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.

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Section A NO CALCULATORS

1. Work out:

(a) $6.91 + 39.5$

(b) 68×39

(c) 0.12×0.8

(d) $1169.6 \div 8$

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

(f) 84 % of 80

(g) $\frac{7}{12} + \frac{3}{8}$

(h) $4\frac{1}{6} \div 1\frac{2}{3}$

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

(a) ab

(b) b^2

(c) $2a + b - c$

(d) $(abc)^2$

3. Simplify these expressions, removing the brackets where appropriate:

(a) $7(x - 4)$

(b) $ab^2c \times a^2b^3$

(c) $\dfrac{36p^3q^4}{12p^2}$

(d) $4 - 3(y - 2)$

4. Factorise these expressions completely:

(a) $5x - 18x^2$

(b) $3y^2 + 15xy$

(c) $x^2 - 8x + 15$

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

(a) $3x + 17 = 50$

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

(c) $2x^2 = 72$

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

(e) $\frac{3.6}{x} = 0.6$

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, ...

(e) Find the nth term for sequence (b) above. Give your answer in terms of n.

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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. **Underline your answers.**

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Section B You may use a calculator for this section.

7. 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?

8. (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.

(d) The height of my dog has increased by 15% over the last year and is now 73.6 cm. What was its height a year ago?

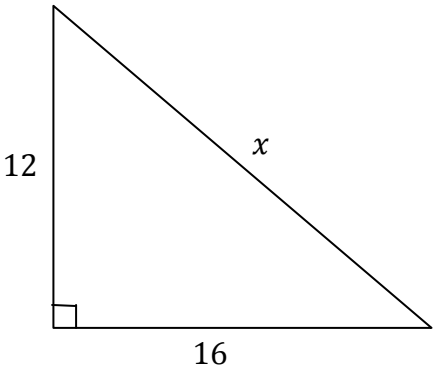
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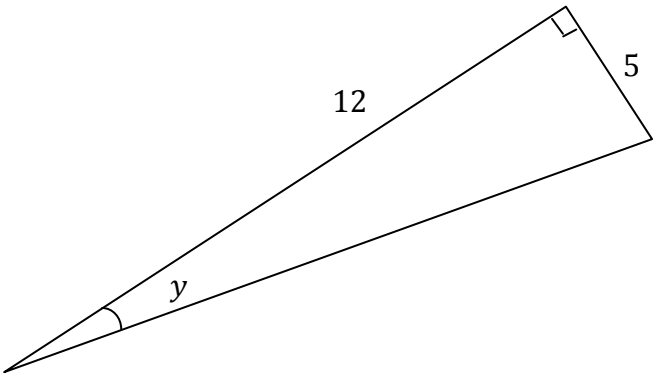
9. A model car travels 1.8 km in 36 minutes.

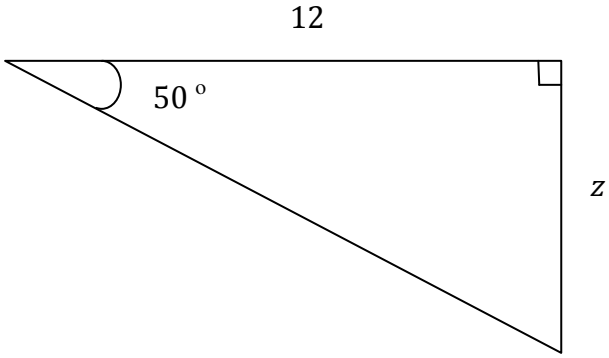
(a) How long would it take to travel 1 km?

(b) What is its speed in metres per second?

10. In the following triangles find the values of x, y and z.







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11. If m and n are prime numbers, and

$m^2n^3 = 108$

Find the values of m and n.

12. 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) $\frac{8!}{6!}$

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

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

THE END

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