2012/4th A
Oundle School

Your Name:

Entrance Examination to the Fourth Form
Mathematics

Section A
30 Minutes

Write ALL of your working on this paper. No other paper may be used. The answers alone ***are of no use.*** *Show enough working on each question to make it clear how you reached your answer. Underline your answers.*

You are NOT allowed to use a calculator for this section. NO CALCULATORS

1. Find 40.9×0.28

2. Work out $123.6 - 14.8$

3. Work out $3\frac{5}{12} \div \frac{5}{6}$

4. Work out $\frac{2}{3} + 1\frac{4}{5}$

5. Given that $1088 \times 3 = 3264$, write down the answers to the following WITHOUT doing additional written calculations:

a) $1088 \times 30 =$

b) $108.8 \times 0.3 =$

c) $32640 \div 3 =$

d) $3.264 \div 1.088 =$

6. Fill in the gaps in these sequences:

a) 3, 7, 11, ____, 19, 23

b) 10, 5, ____, 1.25, ____

c) 2, ___, 10, 17, 26, ___, 50

d) 729, ___, 81, 27, ___, 3, 1

e) 2, 9, 16, 23, ____,
For this sequence what is the formula for the nth term of the sequence?

What is the 99^{th} term?

7. If $a = 7,\ b = -3, c = -4$
What is the value of the following:

a) $abc =$

b) $c^2 - 2b =$

c) $a(c - b) =$

8. Expand, and simplify if possible:

a) $3x^2 \times 2xy$

b) $7 - 2(x - 3)$

c) $18a^3b^2 \div 8a^2b$

9. Factorise completely:

a) $6xy - 2yz$

b) $x^3 + 3x$

10. If $m = 2.9 \times 10^7$ and $n = 8.5 \times 10^7$

a) Write m out in full.

b) Evaluate $m + n$ giving your answer in standard index form (scientific notation)

c) Evaluate mn giving your answer in standard index form.

11. A train ticket increases by 15%.

a) If it was originally £48, how much is it after the increase?

b) If it is £46 after the increase how much was it originally

12. A rectangle with integer length sides (whole numbers eg 2 ,3, 4 etc) has an area numerically equal to its perimeter (the distance around the outside).
Find all the possible dimensions of the rectangle.

2012/4th B
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Section B
30 Minutes

Write ALL of your working on this paper. No other paper may be used. The answers alone ***are of no use.*** *Show enough working on each question to make it clear how you reached your answer. Underline your answers.*

You MAY use a calculator for this section. **CALCULATORS ALLOWED**

1. Solve the following equations to find x, showing the steps in your working clearly.

   a) $7x + 2 = 23$

   b) $7x - 2 = -1$

   c) $10(2x - 1) = 70$

   d) $\frac{5}{x} = 10$

   e) $3x^2 - 7 = 68$

2. Put these numbers in order of size (smallest first)

a) 0.45 0.405 4.5 0.0455 0.422

b) $\frac{5}{9}$ 0.056 55%

3. A snail crawls 2 cm in 15 seconds.

a) At this pace, how far would the snail crawl in 1 hour? (give your answer in metres)

b) At the same pace, how far would the snail crawl in one day? (give your answer in kilometres)

c) At the same pace, how long would it take the snail to crawl 1 km? (Give your answer in days and hours)

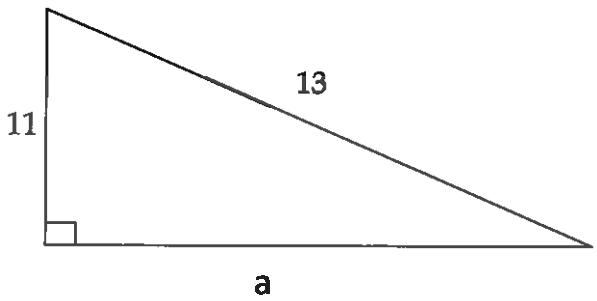
4. A haystack contains enough hay to feed 12 horses for 15 days. For how many days could the same haystack feed 20 horses?

5. The exchange rates in Dec 2012 were as follows:
£ 1 = 12.8 South African Rand (ZAR)
£ 1 = 5 Malaysian Ringgit (MYR)

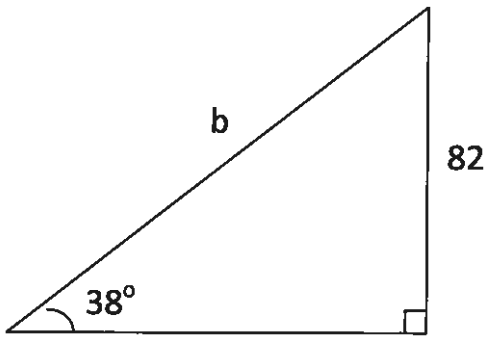
I returned from travelling in South Africa with 1500 Rand, how many Malaysian Ringgit can I buy?

6. In the following right-angled triangles find the values of the letters a and b:
(Give your answers to 3 significant figures)

a)



b)



7. Find six numbers that have a mean and median of 7, a mode of 6.

8. I have three mathematical cats called Ex, Why and Zed.
Ex and Why together weigh 7 kg
Why and Zed together weigh 8 kg
Zed and Ex together weigh 11 kg

a) What would my cats weigh if I weighed all three together?

b) What are the individual weights of my three cats?