2012/3rd A
Oundle School

Your Name:

Entrance Examination to the Third Form — Section A
Mathematics — 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 40.9×28

2. Work out $123.6 - 14.8$

3. Work out $\frac{5}{12} \times \frac{3}{10}$

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

5. Fill in the missing numbers

a) $-4 \times \_\_ = 12$

b) $2+12 \div 4 = \_\_$

c) $14 - \_\_\_ = 17$

d) $0.2 \times \_\_\_ = -1$

Fill in the missing signs $(+ \ - \ \times \ \div)$

e) $6 \_\_\_ 12 \_\_\_ 3 = 10$

Fill in the missing signs (and brackets):

f) $8 \_\_\_ 7 \_\_\_ 3 = 5$

6. Using appropriate approximations (which you should show clearly), estimate the value of:

$$\frac{29.9^2}{99.9 - \sqrt{80.7}}$$

7. 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

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

a) $ab =$

b) $a + b + 2c =$

c) $abc =$

d) $a^2 + c^2 =$

9. Bread is made from flour and yeast in the ratio 32 : 1.

a) How much yeast is mixed with 960 g of flour?

b) How much flour is needed to mix with 400g yeast?

10. 5, 8, 14, 37, 296, 323, 529

From the list of numbers above, write down

a) three prime numbers

b) a square number

c) a cube number

d) a number obtained by multiplying together two other numbers in the list.

11. 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.

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Mathematics

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

2. a) Calculate 13% of 67kg

   b) Decrease 67 kg by 15%

   c) What is 67 kg as a percentage of 91 kg. Give your answer to 2 dec.places.

3. a) What is the mean (average) of the following numbers?

7.2 8.05 17.09 −3.22 12.88

b) What number should be added to increase the mean to 8.9?

4. 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%

5. A snail crawls 30cm in 30 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)

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

7. 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?

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?

9. a) In how many different ways can I pay 10p using standards British coins? Try to be systematic and logical in your solution.

b) How many coins would I need to lay out every combination that adds to 10p?