ST EDWARD'S

OXFORD

13+ SCHOLARSHIP EXAMINATION 2014

MATHEMATICS
Paper 2

1 hour

Name: _____

There are 4 questions and 40 marks available.

NO Calculators are allowed.

Scrap paper is available.

1) A number is made up of digits (0-9). Replace the asterisks by the correct digits to make each calculation work.

```
   * 5
+    *
-------
C * 3
-------
```

```
   * *
×    6
-------
3 * 2
-------
```

```
   * 6 *
×      *
---------
* 7 * 3
---------
```

Use the digits 1, 2, 3, 4, 5, 6 once each to complete this multiplication. Explain why there is only one solution.

```
   * *
×    *
-------
* * *
-------
```

[10 marks]

2) When the whole family comes to stay, we sit on chairs (with four legs) or three-legged stools. These seat have 74 legs between them.

   a. What is the largest number of people that we can be sure of seating? In this case, how many of each type of seat are there?
   b. What is the largest number of people that we might be able to seat? In this case, how many of each type of seat are there?

   Explain your reasoning carefully.

[8 marks]

3) Word Problems

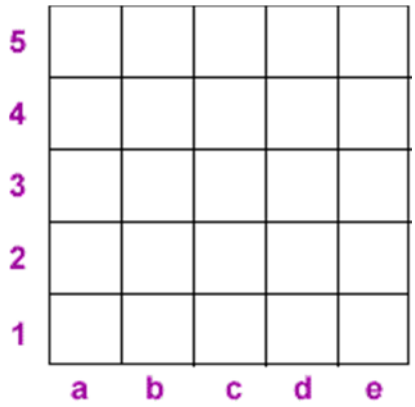
a. In a club there are 20% more girls than boys. After 50 boys left there are twice as many girls as boys. How many girls were in the club?

b. Moses is twice as old as Methuselah was when Methuselah was one-third as old as Moses will be when Moses is as old as Methuselah is now. The difference in their ages is 666 year. How old is Methuselah?

c. Alex has three loaves of bread and Bob has five loaves. Charlie is hungry but has no food – but he does have £8. Charlie agreed to pay his £8 to Alex and Bob if they agree to share the bread equally between the three of them. Alex and Bob agree. How much does Charlie pay to Alex and Bob?

[10 marks]

4) Arrange all the whole numbers from 1 to 25 (inclusive) in the following grid using the clues below.



Clues:

Square numbers are in b5, b3, d3, b1 and c1.

Prime numbers are in a5, c5, e5, c4, a3, c3, e3, e2 and a1.

Triangular numbers are in d5, e4, d3, a1, e1 and c2.

Cube numbers are in d3 and b2.

Powers of 2 are in b5, b2, e2 and b1.

Palindromic numbers are in a5 and d1.

Factors of 100 are in b5, d5, c4, b3, d3, a2 and e2.

The median of all the numbers is in c3.

Row 3 and column c are all odd.

Numbers that are the same upside-down are in a5, d3 and b2.

Every horizontal row, vertical column and the main diagonals add up to 65.

Hints:

32123 is an example of a palindromic number

1, 3, 6, 10 are the first 4 triangle numbers

[12 marks]

END OF TEST