Year 6

3 Hour Mathematics

Non-Calculator Paper

June 2017

Teacher: Mr. Fielding

Duration: 45 minutes

Instructions to Students

* Answer **all** questions.
* Answers must be supported by explanations.
* Answers must show reasoning behind the results or solutions provided.
* If graphs are used to find a solution, they must be sketched as part of your answer.
* Unless indicated otherwise, full marks will not be awarded if the correct answer is not accompanied by supporting evidence of how the results have been achieved.
* When an answer provided is not the correct one, some marks can still be awarded if it is shown than an appropriate method and/or a correct approach has been used.

There are 5 questions on this paper with a total of 27 points.

If you finish within the allocated time, read your answers and check that they are sensible.

*Good luck!*

**Question 1 : Quadratic Equation (7 points)**
Sketch the graph of the parabola $y=x^{2}-2x-8$

Your sketch must show the coordinates for any points of intersection with the coordinate axes and the coordinates of the vertex. (7)

**Question 2 : Calculus (5 points)**

Find the x-coordinates for the stationary points of the function

$$y=x^{3}+x^{2}-5x-6$$

And determine whether or not a stationary point is a local minimum or maximum.

Note : *There is no need to calculate the value of the y coordinate in this question.* (6)

**Question 3 : Probabilty (5 points)**

A single unbiased die has it’s faces labelled 1, 1, 2, 2, 3, 4.

A player throws the die twice and adds up the numbers to get a final score.

Use a 2-dimensional grid, or any other suitable way, to solve the following:

1. Calculate the probability that the final score is 3. (2)
2. Given that the 1st time the die was thrown it was even, calculate the probability that the final score will be even. (3)

**Question 4 : Arithmetic Sequence (5 points)**

The 3rd term of a sequence of numbers is 10 and the 5th term is 16.

Given that the sequence follows an arithmetic progression calculate:

1. The 1st term and the common difference. (2)
2. The sum of the first 10 terms. (3)

**Question 5 : Statistics (5 points)**

The results of 11 students in a test are as follows:

3,7,8,8,10,9,10,12,14,7,1

Calculate the 5 number summary. (2)

State the interquartile range. (1)

Test for outliers and say if any numbers are outliers. (2)