

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 that 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 : Probability (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:

- a. Calculate the probability that the final score is 3. (2)
- b. 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:

- a. The 1st term and the common difference. (2)
- b. 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)