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| logo_b | **S6MA3ENA**  **Mathematics 3 Periods**  **B Test**  **WitHout Calculator**  **Date : 25/06/19**  **11 :45 - 12 :30**  **Teacher : C. searle** |

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| **/ 30** | *Comments* | *Signature* |

**TIME ALLOWED**

* 45 minutes

**NOTES**

* Answer **all** questions.
* 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 **6** questions on this paper.

Each question is worth **5 marks** with a total of **30 marks** available.

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

Good luck !

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|  | *Parabola* |  |
| **Q1** | Two parabolas *ya* and *yb* are plotted on the same graph where  Calculate the coordinates for any points of intersection. | [5 marks] |
|  | *Polynomial Differentiation* |  |
| **Q2** | The function *f*(*x*) is defined as follows:      Show that  *f*(*x*) has a single stationary point and determine if this is a maximum or minimum. | [5 marks] |
|  | *Series* |  |
| **Q3** | A recursive sequence calculates the next term in the sequence from the previous number.  Calculate the terms *u*2, *u*3 and *u*4 for the sequence  and state explicitly what type of sequence this is.  Hence calculate the sum to infinity for this sequence. | [5 marks] |
|  | *Probability* |  |
| **Q4** | A company sells two printers with an extended warranty; the Grafter and the Elite.  For the first 50 sales of each type of printer the number of claims are recorded as follows:   |  |  |  | | --- | --- | --- | |  | Claim | No Claim | | Grafter | 15 | 35 | | Elite | 10 | 40 |   A purchaser is selected at random from this group.  (i) What is the probability that they made a claim on their printer?  (ii) Given that they didn’t make a claim what is the probability that they bought the Elite? | [5 marks] |
|  | *Statistics* |  |
| **Q5** | The heights in cm of 7 plants are recorded as follows:  16, 17, 20, 23, 24, 25, 85  Identify any outliers in this data and calculate an adjusted mean. | [5 marks] |
|  | *Combinatorics* |  |
| **Q6** | Simon has a 4 digit PIN for his phone but he has forgotten what it is.  He knows that all the digits are different and that zero is not used.  What is the probability that he will find the correct PIN by randomly guessing the digits? | [5 marks] |
|  | *End of Examination* |  |