



S6MA3ENA
MATHEMATICS 3 PERIODS
B TEST
WITHOUT CALCULATOR
DATE : 25/06/19
11 :45 - 12 :30
TEACHER : C. SEARLE

/ 30	<i>Comments</i>	<i>Signature</i>

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 !

	<i>Parabola</i>										
Q1	<p>Two parabolas y_a and y_b are plotted on the same graph where</p> $y_a = x^2 - 4x$ $y_b = 16 - x^2$ <p>Calculate the coordinates for any points of intersection.</p>	[5 marks]									
	<i>Polynomial Differentiation</i>										
Q2	<p>The function $f(x)$ is defined as follows:</p> $f(x) = 4\sqrt{x} - x^2 \quad x \in \mathbb{R}, x \geq 0.$ <p>Show that $f(x)$ has a single stationary point and determine if this is a maximum or minimum.</p>	[5 marks]									
	<i>Series</i>										
Q3	<p>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</p> $u_1 = 8$ $u_{n+1} = \frac{1}{2}u_n$ <p>and state explicitly what type of sequence this is.</p> <p>Hence calculate the sum to infinity for this sequence.</p>	[5 marks]									
	<i>Probability</i>										
Q4	<p>A company sells two printers with an extended warranty; the Grafter and the Elite.</p> <p>For the first 50 sales of each type of printer the number of claims are recorded as follows:</p> <table border="1" data-bbox="518 1547 1045 1753"> <tr> <td></td><td>Claim</td><td>No Claim</td></tr> <tr> <td>Grafter</td><td>15</td><td>35</td></tr> <tr> <td>Elite</td><td>10</td><td>40</td></tr> </table> <p>A purchaser is selected at random from this group.</p> <p>(i) What is the probability that they made a claim on their printer?</p> <p>(ii) Given that they didn't make a claim what is the probability that they bought the Elite?</p>		Claim	No Claim	Grafter	15	35	Elite	10	40	[5 marks]
	Claim	No Claim									
Grafter	15	35									
Elite	10	40									

	<i>Statistics</i>	
Q5	<p>The heights in cm of 7 plants are recorded as follows:</p> <p style="text-align: center;">16, 17, 20, 23, 24, 25, 85</p> <p>Identify any outliers in this data and calculate an adjusted mean.</p>	[5 marks]
	<i>Combinatorics</i>	
Q6	<p>Simon has a 4 digit PIN for his phone but he has forgotten what it is.</p> <p>He knows that all the digits are different and that zero is not used.</p> <p>What is the probability that he will find the correct PIN by randomly guessing the digits?</p>	[5 marks]
	<i>End of Examination</i>	