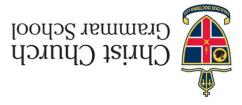
2018 UNIT TEST 6



to the supervisor before reading any further.

Important note to candidates

MATHEMATICS METHODS Year 11

Section Two: Calculator-assumed

Special items: drawing instruments, templates, and up to three calculators approved for use in the WACE examinations						
To be provided by the candidate standing coloured), sharpener, standard items: pens (blue/black preferred), pencils (including coloured), sharpener, correction fluid/tape, eraser, ruler, highlighters						
Materials required/recommended for this section To be provided by the supervisor This Question/Answer Booklet Formula Sheet (retained from Section One)						
Time and marks available for this section 30 minutes Acks available: 34 marks 34 marks						
Teacher name						
Student name						

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it

CALCULATOR-ASSUMED

2 MATHEMATICS METHODS Year 11

Instructions to candidates

- Write your answers in this Question/Answer Booklet.
- 2. Answer all questions.
- You must be careful to confine your response to the specific question asked and to follow any instructions that are specific to a particular question.
- 4. Supplementary pages for the use of planning/continuing your answer to a question have been provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.
- 5. Show all your working clearly. Your working should be in sufficient detail to allow your answers to be checked readily and for marks to be awarded for reasoning. Incorrect answers given without supporting reasoning cannot be allocated any marks. For any question or part question worth more than two marks, valid working or justification is required to receive full marks. If you repeat an answer to any question, ensure that you cancel the answer you do not wish to have marked.
- 6. It is recommended that **you do not use pencil**, except in diagrams.

ce that exceeds 1400 .	Calculate the value of the first term in this sequence that exc						
	<u>Z</u> /						
The values of the first four terms of a geometric sequence are as follows:					Question number:		
(4 marks)		Question 4			Additional working space		
MATHEMATICS METHODS Year 11	3	CALCULATOR-ASSUMED	MATHEMATICS METHODS Year 11	10	CALCULATOR-ASSUMED		

(c) The hall is extended by adding more rows at the back of the hall, taking the same pattern. If the final seating capacity of the hall is 3410, how many more rows were added? (3 marks)

CALCULATOR-ASSUMED

MATHEMATICS METHODS Year 11

9

Additional working space

Question number:	
zuesuon number.	

MATHEMATICS METHODS Year 11	2	CALCULATOR-ASSUMED	MATHEMATICS METHODS Year 11	8	CALCULATOR-ASSUMED

Question 6

The curve w(x) has the gradient function:

$$4 - xd + 2xb = (x)$$

(2 marks)

where a and b are constants. The curve w(x) passes through the origin and has turning points at x=-2 and x=3. Determine the values of a and b and give the equation of w(x).

Question 9 (5 marks)

Consider the recurring decimal 0. 16.

(a) Show that this recurring decimal can be written as an infinite geometric series with first term $\frac{16}{100}$ and common ratio $\frac{1}{100}$. (3 marks)

(b) Using your answer from part (a), show how $0.\overline{16}$ can be written as a fraction in its simplest form. (2 marks)

Euq ot duestions See next page

Question 8

(8 marks)

(1 mark)

6 **Question 7** (5 marks)

Peter can swim 200 metres in 188.6 seconds. He is about to start a training program and he aims to reduce his time by 4% week on week after each week's training (that is, he wants his time at the end of the first week of training to be 4% less than his time at the start of the program and his time at the end of the second week of training to be 4% less than his time at the end of the first week, etc.).

Give the following for Peter's times for the 200 metres after n weeks of training:

(i) a recursive equation, (2 marks)

(1 mark)

the equation for the n^{th} term in the sequence in terms of n.

During which week of training would Peter expect his 200 metres to first reach 143 seconds. (2 marks) The displacement of a particle moving along the x-axis is given by:

$$x(t) = t^3 - 9t^2 + 24t$$

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where x is in metres and t is in seconds, $t \ge 0$.

Calculate the following:

- (a) The displacement of the particle after 3 seconds of motion.
- (b) An expression for the velocity of the particle in terms of t. (1 mark)
- (c) The displacement of the particle at the times when its velocity is zero. (3 marks)

The total distance travelled by the particle in the first five seconds of its motion. (3 marks)