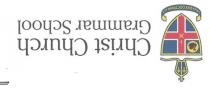


2018 UNIT TEST 6



MATHEMATICS METHODS Year 11 Section One:

Section One: Calculator-free

| Fime and marks available for this section seading time before commencing work: |
|--|
| Теасhег пате |
| Student name |

Marks available: 15 minutes

Working time for this section: 15 minutes

Marks available: 15 minutes

Materials required/recommended for this section To be provided by the supervisor This Question/Answer Booklet Formula Sheet

To be provided by the candidate Standards (including coloured), sharpener, Standard items: pens (blue/black preferred), pencils (including coloured), sharpener, correction fluid/tape, eraser, ruler, highlighters

Special items: nil

Important note to candidates

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 to the supervisor before reading any further.

CALCULATOR-FREE

MATHEMATICS METHODS Year 11

Instructions to candidates

- 1. Write your answers in this Question/Answer Booklet.
- 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.

2

- 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.

(3 marks)

(4 marks)

Cuestion 1

Calculate the following:

MATHEMATICS METHODS Year 11

9

CALCULATOR-FREE

Additional working space

Question number:

(a) The equation of the curve.

つくしをこしれりす

A curve y = f(x) passes through the point (3,2) and has $f'(x) = 3 - x^2$.

f(x) = 3x - 3x3 + C (bu eyminn of wave in

2+ (1) = 2 × 3 - 7 (1 /2) osn

C=2 (In worred value of constant)

(my sur - 2x2+2 (for find equation)

Moke: can also have

(1 mark)

(b) The value of y when x = -1.

Note: can also have ffx1=-2/3 as auswer (answarmy M) 1. E-== マナデナ とー こ 7+(1-)E- (1)x&=h. 1-=x p

See next page

(6 marks)

Question 2

 S_n , the sum of the first n terms of an arithmetic sequence, is given by:

$$S_n = 17n - 3n^2$$

(a) Determine the sum of the first 10 terms of the arithmetic sequence.

(1 mark)

(b) Show that the first and second terms of the arithmetic sequence are 14 and 8 respectively. (3 mark

$$S_1 = 17 \times 1 - 3 \times 1^2 = 14 = 1st term$$

$$V(gires first termin')$$

$$Sequence)$$

$$S_2 = 17 \times 2 - 3 \times (2)^2 = 22$$

$$V(first un of first two terms of sequence)$$

(c) Give a simplified expression, in terms of n, for the n^{th} term of the arithmetic sequence. (2 marks)

See next page

CALCULATOR-FREE

Question 3

MATHEMATICS METHODS Year 11

5 MATHEMATICS

(5 marks)

Two particles A and B are moving along a straight path so that their displacements x_A and x_B metres relative to the origin O at time t seconds ($t \ge 0$) are given by $x_A = 3t^2 + 5t - 10$ and $x_B = -2t^2 + 15t + 5$ respectively. Calculate the speeds of the two particles at the instant they collide.

For collision:

$$3t^2 + 5t - 10 = -2t^2 + 15t + 5$$
 $5t^2 - 10t - 15 = 0$
 $t^2 - 2t - 3 = 0$
 $(t-3)(t+1) = 0$
 $t=3$, -1 (discount $t=-1$)

as $t \neq 0$

So collision at $t=3$
 $t=3$

End of auestions