Christ Church Grammar School

**MATHEMATICS METHODS Year 11**
**Section One:**
**Calculator-free**

Your name  _____

Teacher name  _____

**Time and marks available for this section**

Reading time before commencing work:  2 minutes
Working time for this section:  15 minutes
Marks available:  15 marks

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

*To be provided by the candidate*
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.

## Instructions to candidates

1. The rules of conduct of the CCGS assessments are detailed in the Reporting and Assessment Policy. Sitting this assessment implies that you agree to abide by these rules.

2. Write your answers in this Question/Answer Booklet using blue/black pen. Do not use erasable or gel pen.

3. Answer all questions.

4. You must be careful to confine your response to the specific question asked and to follow any instructions that are specified to a particular question.

5. 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.

6. **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.

7. It is recommended that **you do not use pencil**, except in diagrams.

**Additional working space**

Question number: _____

## Question 1 (4 marks)

For the graph of $y = 10x - 2x^2 + 4$, determine:
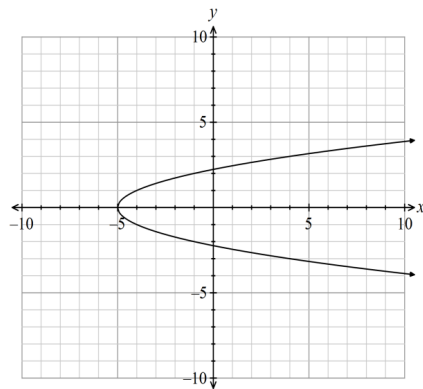
(a) the coordinates of the $y$–intercept, (1 mark)

(b) the equation of the line of symmetry, and (1 mark)

(c) the location and the nature of the turning point. (2 marks)

## Question 4 (4 marks)

The three points $A(p + 11, 17)$, $B(-2, p)$ and $C(1, 7)$ are collinear. Determine the value(s) of $p$.

**Question 2**  (4 marks)

The graph below contains two functions, $f(x) = \sqrt{5 + x}$ and $g(x)$.



(a)  Write the equation of $g(x)$ and explain why combining $f(x)$ and $g(x)$ as shown in the graph does not represent one single function.  (2 marks)

(b)  Write the domain of $f(x)$.  (1 mark)

(c)  Write the range of $g(x)$.  (1 mark)

**Question 3**  (3 marks)

If $f(x) = x^3 + 4x^2 - 4x - 16 = (x - 2)(ax^2 + bx + c)$, then determine the values of $a$, $b$ and $c$.