

**Scotch College**

**Semester Two Examination, 2015**

**Question/Answer Booklet**

**YR 11**

**Mathematics Methods**

**Section One:**

**Resource Free**

**Teacher:**

**Name:**

**Time allowed for this section**

Reading time before commencing work: 5 minutes

Working time for this section: 50 minutes

**Material 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, pencils, pencil sharpener, eraser, correction fluid, ruler, highlighters

**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.

**Structure of this paper**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Section | Number of questions available | Number of questions to be answered | Working time (minutes) | Marks  available |
| Section One:  Calculator-free | 9 | 9 | 50 | 50 |
| Section Two  Calculator-assumed | 13 | 13 | 100 | 100 |
|  |  |  |  | 150 |

**Instructions to candidates**

1. The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2015*. Sitting this examination implies that you agree to abide by these rules.

2. Write your answers in the spaces provided in this Question/Answer Booklet. Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

* + Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
  + Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question(s) that you are continuing to answer at the top of the page.

3. **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.

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

**Question 1** **(4 marks)**

Write down an exact value for each of the following:

1.  (1 mark)
2. sin 120° (1 mark)
3. tan 120° × sin 60° (2 marks)

**Question 2 (5 marks)**

Simplify with positive indices:

1.  (2 marks)
2.  (3 marks)

**Question 3 (4 marks)**

Differentiate each of the following (do not simplify):

1.  (2 marks)
2.  (2 marks)

**Question 4 (7 marks)**

Kristen decides to get special invitation cards printed for her 21st birthday party. The price she is quoted is $6 for the first card, $5.90 for the second card, $5.80 for the third card and the pattern continues down to a minimum price of $3.50.

Determine:

1. The cost of the tenth card printed. (2 marks)
2. Which card number first costs $3.50? (2 marks)
3. Kristen plans to invite 30 people to her birthday party. How much will it cost her for the invitation cards? (3 marks)

**Question 5 (4 marks)**

Determine *y* in terms of *x* given that  and *y* = 4 when *x* = -1.

**Question 6 (5 marks)**

Given the function 

1. Determine:

1.  (1 mark)

(ii) *a*, if  (2 marks)

1. State the natural domain and corresponding range of 

(2 marks)

**Question 7 (8 marks)**

Solve the following for *x* over the given domain, showing use of trigonometric identities where appropriate.

(a)  for  (2 marks)

1.  for  (3 marks)

1.  for  (3 marks)

**Question 8 (6 marks)**

Show use of index rules to solve the following equations.

(a)  (2 marks)

(b)  (4 marks)

**Question 9 (7 marks)**

A bag contains 7 marbles, 5 red and 2 blue. Two marbles are drawn one at a time, without replacement.

Determine the probability that the result is:

(Space allocated for a tree diagram, note no marks are given for this)

1. Both red. (1 mark)
2. Both the same colour. (2 marks)
3. At least one blue. (2 marks)
4. Red first given blue second. (2 marks)

***Structure of this section***

|  |  |  |
| --- | --- | --- |
| **Question** | **Marks available** | **Marks obtained** |
| 1 | 4 |  |
| 2 | 5 |  |
| 3 | 4 |  |
| 4 | 7 |  |
| 5 | 4 |  |
| 6 | 5 |  |
| 7 | 8 |  |
| 8 | 6 |  |
| 9 | 7 |  |
| Total for this section | 50 |  |