**ROSSMOYNE SHS**

Semester 1 2010 Examination

MATHEMATICS 2A

Section One: Calculator-free

STUDENT’S NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

TEACHER:-  
(Circle one name) FLETCHER TANDAY

**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

Special items: nil

**Important note to candidates**

No other items may be used in this section of the examination. 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  available  (minutes) | Marks available |
| Section One:  Calculator-free | 7 | 7 | 50 | 40 |
| Section Two:  Calculator-assumed | 15 | 15 | 100 | 80 |
|  |  |  |  | 120 |

**Instructions to candidates**

1. The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2010*. 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.

**SECTION ONE**

**Question 1 [1, 1, 1 = 3 marks]**

The formula

****

gives the distance *s* metres , travelled by an object that begins with an initial (starting) speed of *u* metres per second and that finishes with a final speed of *v* metres per second, for *t* seconds.

1. Find *s* given *u* = 0, *v* = 60 and *t* = 10.
2. Find *t*  given *s* = 140,  *u* = 10 and *v* = 30.
3. What was the initial speed of an object that travelled 120 metres in 15 seconds and had a final speed of 12 metres per second?

**Question 2 [1, 1, 2, 2 = 6 marks]**

Solve the following equations:-



1. 
2. 
3. 



1. 

**Question 3 [6, 2, 1 = 9 marks]**

1. Determine the equation of each line shown below.



**Line 6**

**Line 4**

**Line 5**

Line 1 - Line 4 -

Line 2 - Line 5-

Line 3 - Line 6 -

1. Find the gradient, the *x* - intercept and the y- intercept of the line ***x* - 2*y* = 8.**
2. Is the point **(1⋅5, -4)** on the line whose equation is **6x - *y* = 12.**

Explain why / why not.

**Question 4 [4, 2 = 6 marks]**

The temperature at mid-day at a particular location was recorded on every day of a particular month. The temperatures were recorded to the nearest degree Celsius and the data was then grouped to give the table below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Mid –day Temperature (oC)** | **15→19** | **20→24** | **25→29** | **30→34** | **35→39** | **40→44** |
| **Frequency**  **(Number of Days)** | **2** | **6** | **10** | **7** | **4** | **1** |

1. On the axes below, draw a fully labelled histogram of the data given in the table above.



1. On the histogram, sketch the frequency polygon

**Question 5 [2, 2, 2, 2 = 8 marks]**

Show the following transformations on the axes below:-

|  |  |
| --- | --- |
| **a)** Translate ABC 4 units down  and 2 units right | **b)**Rotate ABC 180o clockwise  about A |
| **c)** Reflect ABC in the Y axis | **d)** Rotate ABC 90o clockwise  about the point (1, 1). |

**Question 6 [3 marks]**

The costs to a book publishing company for publishing a book comprise of a cost for typesetting - which is a **fixed cost** (it is a constant amount - irrespective of the number of books produced) plus a **variable cost** (which will vary, depending on the number of books produced). The company calculated that to produce 20 000 copies of a particular book the cost would be $ 275 000 whilst to produce 23 000 copies the cost would be $ 311 000.

Calculate the fixed cost, variable cost and the cost for 15000 books.

**Question 7 [1, 1, 1, 1, 1 = 5 marks]**

Scores on a test for a class of students:-

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Score** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **Frequency** | **0** | **1** | **5** | **5** | **4** | **4** | **4** | **2** |

Answer the following questions for the above set of scores:-

1. How many students are in the class

1. What is the mode
2. What is the median
3. What is the mean
4. What percentage of students scored 7 or less

**END OF QUESTIONS**

**Additional working space**

Question number(s): \_\_\_\_\_\_\_\_\_\_