C:\Documents and Settings\Amy Shaw\Local Settings\Temporary Internet Files\Content.IE5\Y7YD832X\MC900154518[1].wmf **Revision Examination Assessment Papers (REAP)**

**Semester 1 Examination 2012**

**Question/Answer Booklet**

(This paper is not to be released to take home before 25/6/2012)

**MATHEMATICS 2A**

**Section One:**

**Calculator-free**

Name of Student: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Marking key\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Time allowed for this section**

Reading time before commencing work: 5 minutes

Working time for this section: 50 minutes

**Materials required/recommended for this section**

***To be provided by the supervisor***

This Question/Answer Booklet

Formula Sheet

***To be provided by the student***

Standard items: pens, pencils, pencil sharpener, eraser, correction fluid/tape, ruler,

highlighters

Special items: nil

**Important note to students**

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 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 | Percentage of exam |
| Section One  Calculator-free | 6 | 6 | 50 | 50 |  |
| Section Two  Calculator-assumed | 11 | 11 | 100 | 100 |  |

|  |  |  |
| --- | --- | --- |
| Total | 150 | 100 |

**Instructions to students**

1 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. 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.

2 **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.

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

**Section One: Calculator-free (50 marks)**

This section has **six (6)** questions. Answer all questions. Write your answers in the spaces provided.

Working time: 50 minutes

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Question 1 (8 marks)**

(a) Express 76.6952 correct to two decimal places. (1)

|  |
| --- |
| **Solution** |
| 76.70 |
| **Specific behaviours** |
| ✓ or X |

(b) Given that 165 x 26.4 = 4356, find the exact value of

(i) 1.65 x 2640 (1)

|  |
| --- |
| **Solution** |
|  |
| **Specific behaviours** |
| ✓ or X |

(ii) 43.560.0264 (2)

|  |
| --- |
| **Solution** |
|  |
| **Specific behaviours** |
| ✓ working and reasoning  ✓ correct answer of 1650 |

(c) List the following in **descending** order

, , %,  (2)

|  |
| --- |
| **Solution** |
|  |
| **Specific behaviours** |
| ✓✓ correct order |

(d) Benjamin bought a DVD player for $330 which included 10% GST. What is the value of the GST component? (2)

|  |
| --- |
| **Solution** |
| i.e.    Ie, GST component is $ 30 |
| **Specific behaviours** |
| ✓ working and reasoning  ✓ correct answer of $30 |

**Question 2 (11 marks)**

(a) A child’s wheelbarrow is a scale model of an adult’s wheelbarrow.

The lengths of the two wheelbarrows are 48cm and 120cm.

[](http://www.google.com.au/imgres?imgurl=http://image.made-in-china.com/2f0j00pBNEVehsfcuK/Wheel-Barrows-WB6200-.jpg&imgrefurl=http://qdluckytube.en.made-in-china.com/product/IqUQemCOEoRd/China-Wheel-Barrows-WB6200-.html&h=388&w=453&sz=23&tbnid=oiZDFgFauoJb6M:&tbnh=104&tbnw=121&prev=/search?q=pictures+of+wheelbarrows&tbm=isch&tbo=u&zoom=1&q=pictures+of+wheelbarrows&docid=lJItSYY9ERov_M&hl=en&sa=X&ei=nLt_T7rGNuS0iQf0p5HWBA&ved=0CFQQ9QEwAg&dur=767)

48 cm

120 cm

1. The radius of the wheel of the adult’s wheelbarrow is 12.5cm. Find the radius of the wheel of the child’s. (2)

|  |
| --- |
| **Solution** |
| Radius of wheel of child’s wheelbarrow is 5 cm |
| **Specific behaviours** |
| ✓ working  ✓ correct answer of 5 cm |

1. If the child’s wheelbarrow can hold 20kg of sand, how much sand can the adult’s wheelbarrow hold? (2)

|  |
| --- |
| **Solution** |
|  |
| **Specific behaviours** |
| ✓ working  ✓correct answer of 50 kg |

(b) It took Daniel 252 minutes to complete the City to Surf Marathon. Hanson took hour longer than Daniel.

1. How long did Hanson take to complete the marathon? (2)

|  |
| --- |
| **Solution** |
| or 4 hr and 27min |
| **Specific behaviours** |
| ✓ working  ✓ correct answer in minutes or hours and minutes |

**Question 2 (continued)**

1. Daniel completed the marathon at 10.20a.m. At what time did the marathon start? (1)

|  |
| --- |
| **Solution** |
| Daniel took 4 hours and 12 minutes to complete Marathon  Marathon started at 6:08 a.m. |
| **Specific behaviours** |
| ✓ 252 mins = 4 hours 12 minutes  ✓ correct starting time |

(c) Given that *x* and *y* are integers such that , calculate

1. The largest value of  (1)

|  |
| --- |
| **Solution** |
|  |
| **Specific behaviours** |
| ✓ or X |

1. The smallest value of  (1)

|  |
| --- |
| **Solution** |
|  |
| **Specific behaviours** |
| ✓ or X |

(d) Find the exact value of

1. 0.7-0.007 (1)

|  |
| --- |
| **Solution** |
| 0.693 |
| **Specific behaviours** |
| ✓ or X |

1.  (1)

|  |
| --- |
| **Solution** |
|  |
| **Specific behaviours** |
| ✓ or X |

**Question 3 (6 marks)**

(a) The data below shows the results of a Science test written by 32 students. The test is marked out of 10.

4, 1, 6, 1, 6, 7, 2, 4, 4, 5, 5, 2, 5, 5, 9, 5, 4, 4, 6, 7, 1, 2, 7, 1, 1, 6, 6, 5, 5, 6, 10, 7

1. Draw a frequency table for this data. (2)

|  |  |  |
| --- | --- | --- |
| Mark | Tally | Frequency |
| 1 |  | 5 |
| 2 |  | 3 |
| 3 |  | 0 |
| 4 |  | 5 |
| 5 |  | 7 |
| 6 |  | 6 |
| 7 |  | 4 |
| 8 |  | 0 |
| 9 |  | 1 |
| 10 |  | 1 |
| **Solution** | | | | |
| As per completed table | | | | |
| **Specific behaviours** | | | | |
| ✓✓ all correct entries | | | | |

1. Construct a dot frequency graph. (2)

|  |
| --- |
| **Solution** |
|  |
| **Specific behaviours** |
| ✓✓ correct number of dots in each column |

1. Describe the spread of this data set. (2)

|  |
| --- |
| **Solution** |
| Not spread out, tightly packed with 2 clusters (1 to 2) and (4 to 7), 2 outliers 9,10 |
| **Specific behaviours** |
| ✓✓ |

**Question 4 (8 marks)**

(a) In the first week of spring, 180 houses were sold in the Bunbury area by four real estate agents. The graph below shows the proportion sold by each agency.

1. Which agency sold 45 houses? (1)

|  |
| --- |
| **Solution** |
| Century Real Estate |
| **Specific behaviours** |
| ✓ or X |

1. Explain your choice of agency. (1)

|  |
| --- |
| **Solution** |
| of 180 and Century Real Estate has a quarter sector of the circle graph |
| **Specific behaviours** |
| ✓ for identifying sector is a quarter of circle |

(b) The ages of four friends are 5, 6, 7 and 8. Another person joins the group so that the mean

age is now 8. What is the age of the person who joined the group? (2)

|  |
| --- |
| **Solution** |
| 26 + x = 40  X = 14  Age of new person is 14 years old |
| **Specific behaviours** |
| ✓ working or calculation  ✓ correct answer of 14 years old |

**Question 4 (continued)**

(c) Mrs Smith asked the 15 students in her class how many brothers each had. The responses were recorded in a frequency table below.

|  |  |
| --- | --- |
| Number of brothers | Frequency |
| 0 | 4 |
| 1 | 3 |
| 2 | 6 |
| 3 | x |

1. How many students had 3 brothers? (1)

|  |
| --- |
| **Solution** |
| 4 + 3 + 6 + x = 15, x = 2 |
| **Specific behaviours** |
| ✓ or X |

1. What is the median number of brothers of the students in Mrs Smith’s class? (1)

|  |
| --- |
| **Solution** |
| Median is 2 |
| **Specific behaviours** |
| ✓ or X |

(d) When Emily bought a jacket marked at $250, she only had to pay $200 as it was on sale. What was Emily’s percentage discount? (2)

|  |
| --- |
| **Solution** |
| Discount is $ 50 |
| **Specific behaviours** |
| ✓ discount of $50  ✓ correct 20% |

**Question 5 (9 marks)**

(a) Solve the equation for  showing all working steps.

 (3)

|  |
| --- |
| **Solution** |
| 2x – 6 = 4x + 4  -2x = 10  x = - 5 |
| **Specific behaviours** |
| ✓ expand brackets correctly  ✓ collect LIKE terms and simplify  ✓ correct answer of -5 |

(b) If PQR is such that PR = 8 cm, QR = 15 cm and PQ = 17 cm, classify the type of PQR

by the angle. Justify your answer. (3)

|  |
| --- |
| **Solution** |
| P  R Q      is a right-angled triangle with angle R 900. |
| **Specific behaviours** |
| ✓ identify the Pythagorean triplet  ✓ states triangle is right  ✓ angle R is 900 |

(c) Jenny’s house is sold by Raye White’s Real Estate for $380 000. The real estate agency charges a fee for their service as follows.

|  |  |
| --- | --- |
| Value of sale | Raye White’s Real Estate fee |
| Less than $ 100 000 | 5% |
| From $ 100 001 to $ 300 000 | $ 6000 + 3% of each $ over $ 100 000 |
| More than $ 300 000 | $ 9 000 + 4% of each $ over $ 300 000 |

What is the commission for selling Jenny’s house? (3)

|  |
| --- |
| **Solution** |
| 9000 + 4% of $ 80 000 = $ 12 200 |
| **Specific behaviours** |
| ✓ fix fee of $9 000  ✓ 4% of $ 80 000  ✓ calculates correct answer of $ 12 200 |

**Question 6 (8 marks)**

Chris started to make this pattern of shapes using matchsticks.



Shape 1 Shape 2 Shape 3

The table of results is shown below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Shape number, n | 1 | 2 | 3 | 4 | 5 |
| Number of matchsticks, m | 6 | 10 | 14 | **18** | **22** |

(i) Complete the table above. (1)

|  |
| --- |
| **Solution** |
| As shown in table |
| **Specific behaviours** |
| ✓ or X |

(ii) Plot the data on the axes below. (1)



|  |
| --- |
| **Solution** |
| As shown on diagram |
| **Specific behaviours** |
| ✓ all points correctly |

(iii) Can these points be joined? Explain your answer. (2)

|  |
| --- |
| **Solution** |
| No because there is no shape number 1.5,2.5,… |
| **Specific behaviours** |
| ✓ answer of NO  ✓ reason |

**Question 6 (continued)**

(iv) Write a rule for m and n (2)

|  |
| --- |
| **Solution** |
| m = 4n + 2 |
| **Specific behaviours** |
| ✓ correct gradient  ✓ correct “c” value |

(v) Which shape would use exactly 486 match sticks? (2)

Show how you work out this answer.

|  |
| --- |
| **Solution** |
| 486 = 4n + 2  4n = 484  n = 121  Shape number 121 |
| **Specific behaviours** |
| ✓ equates 486 to equation  ✓ correct answer of 121 |