



WA Exams Practice Paper E, 2015
Question/Answer Booklet

**MATHEMATICS
APPLICATIONS
UNIT 1**

**Section One:
Calculator-free**

If required by your examination administrator, please
place your student identification label in this box

Student Number: In figures

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | | | | | |
|--|--|--|--|--|--|--|--|

In words

Your name

Time allowed for this section

Reading time before commencing work: five minutes

Working time for section: fifty 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

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.

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 | 7 | 7 | 50 | 52 | 35 |
| Section Two: Calculator-assumed | 12 | 12 | 100 | 98 | 65 |
| Total | | | | 150 | 100 |

Instructions to candidates

1. The rules for the conduct of examinations are detailed in the school handbook. Sitting this examination implies that you agree to abide by these rules.
2. Write your answers in this Question/Answer Booklet.
3. 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.
4. 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 that you are continuing to answer at the top of the page.
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 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.
7. The Formula Sheet is **not** to be handed in with your Question/Answer Booklet.

Section One: Calculator-free**35% (52 Marks)**

This section has **seven (7)** questions. Answer **all** questions. Write your answers in the spaces provided.

Working time for this section is 50 minutes.

Question 1**(8 marks)**

- (a) The distance travelled by a body is given by $s = ut + \frac{1}{2}at^2$. Determine the distance travelled when

(i) $u = 3$, $t = 2$ and $a = 10$. (2 marks)

(ii) $u = 9.5$, $t = 10$ and $a = 4.6$. (2 marks)

- (b) The variables R and p are related by the formula $R = \frac{24}{10 - p}$. Determine

(i) the value of R when $p = 0$. (1 mark)

(ii) the value of R when $p = 7.6$. (1 mark)

(iii) the value of p when $R = 24$. (2 marks)

Question 2**(9 marks)**

The table below shows the equivalent amount of foreign currency for various amounts of Australian dollars.

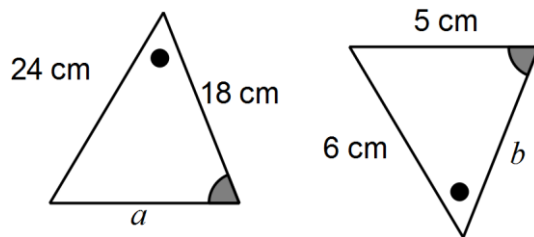
| Foreign currency | Australian Dollars (A\$) | | | | |
|-------------------|--------------------------|-------|-------|-------|--------|
| | 10 | 20 | 50 | 100 | 300 |
| Euro | 6.70 | 13.40 | 33.50 | 67.00 | 201.00 |
| Indian Rupee | 515 | 1030 | 2575 | 5150 | 15450 |
| Malaysian Ringgit | 29 | 58 | 145 | 290 | 870 |
| Vanuatu Vatu | 860 | 1720 | 4300 | 8600 | 25800 |

- (a) State the Indian Rupee exchange rate for one Australian Dollar. (1 mark)
- (b) How many Malaysian Ringgit could be bought for A\$50? (1 mark)
- (c) How many Australian Dollars are 257.50 Indian Rupees worth? (1 mark)
- (d) Which is worth more – 1000 Vanuatu Vatus or 1000 Indian Rupees? Justify your answer. (2 marks)
- (e) How many Euros could be bought for 450 Australian Dollars? (2 marks)
- (f) How many Australian dollars are 8758 Malaysian Ringgits worth? (2 marks)

Question 3

(8 marks)

- (a) The two triangles shown are similar. Determine the values of the pronumerals a and b .
(3 marks)



- (b) A building casts a shadow of 40 m while the shadow of a 3 m tall lamp post is 8 m long. Determine the height of the building.
(3 marks)
- (c) A photograph that is 10 cm long is enlarged so that the same side now measures 15 cm. If the area of the original photograph was 80 cm^2 , determine the area of the enlarged photograph.
(2 marks)

Question 4**(5 marks)**

A plan of the ground floor of a house has a scale of 1 : 100. The actual dimensions of the dining room in the house are 4.5 m by 6 m.

- (a) Determine the actual area of the dining room, in square metres. (1 mark)
- (b) Determine the dimensions of the dining room on the plan, giving your measurements in millimetres. (2 marks)
- (c) Another room on the plan measures 38 mm by 52 mm. Determine the actual dimensions of this room in the house, giving your measurements in metres. (2 marks)

Question 5

(7 marks)

The table below has been created using the formula $C = \frac{2a + 3b}{10}$ to calculate the cost, in dollars, of a product that uses a grams of one ingredient and b grams of another ingredient.

| Cost (\$) | | a (g) | | | | |
|-----------|----|----------|------|----------|----------|------|
| | | 4 | 8 | 12 | 16 | 20 |
| b (g) | 2 | P | 2.20 | 3.00 | 3.80 | 4.60 |
| | 4 | 2.00 | 2.80 | Q | 4.40 | 5.20 |
| | 6 | 2.60 | 3.40 | 4.20 | 5.00 | 5.80 |
| | 8 | 3.20 | 4.00 | 4.80 | 5.60 | 6.40 |
| | 10 | 3.80 | 4.60 | 5.40 | R | 7.00 |

(a) Determine the missing values of P, Q and R in the table. (3 marks)

(b) Use one example to show that the formula $C = \frac{a}{5} + 0.3b$ could also be used to create the table above. (1 mark)

(c) Use one example to show that the formula $C = 0.2a + \frac{b}{3}$ could **not** be used to create the table above. (1 mark)

(d) Determine the value of a if the cost of the product when $b = 20$ is \$12.40. (2 marks)

Question 6

(9 marks)

Four matrices are given by $A = \begin{bmatrix} 1 & 2 & 3 \\ -1 & 0 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$, $C = \begin{bmatrix} 2 & -6 \end{bmatrix}$ and $D = \begin{bmatrix} 2 & -2 \\ 0 & 4 \end{bmatrix}$.

- (a) Name the matrix for which the element in row 1 and column 2 is the number 2 and also state the size of this matrix. (2 marks)
- (b) Determine the value of $d_{12} \times a_{23}$. (1 mark)
- (c) It is possible to calculate one of $BC + D$ or $CB + D$, but not both. State which calculation is not possible and explain why. (2 marks)
- (d) Determine the missing values p and q if $\begin{bmatrix} 4 & p \end{bmatrix} \times A = \begin{bmatrix} 7 & 8 & q \end{bmatrix}$. (2 marks)
- (e) Calculate $DB + 2B$. (2 marks)

Question 7**(6 marks)**

The radii of two spherical balloons filled with helium are 40 cm and 60 cm.

(a) State, in simplest form, the ratio of their

(i) radii. (1 mark)

(ii) surface areas. (1 mark)

(iii) volumes. (1 mark)

(b) One third of the helium in the larger of the balloons is released. Determine the new ratio of their volumes, in simplest form. (3 marks)

Additional working space

Question number: _____

Additional working space

Question number: _____

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