

MATHEMATICS FACULTY ASSESSMENT ITEM

Course Title & No.: Mathematical Applications T – 1286
Unit Title & No.: Unit 2 – 13810
Assessment Period: Semester 2
Assessment Name: Assignment 1
Assessment Type: Take-home
Unit Teacher(s): Chris Cutting, Ganesh Prasad, David Stone
Issue Date: Monday Week 4 13/08/2018
Due Date: Monday Week 6 Monday 27/08/2018 by COB(4pm)
Weighting: 15%
Submission Format: Hardcopy or Digital

Completion Instructions

Instructions

You may complete this assignment either digitally or via hand written. Note that it will be easier to complete digitally

Assessment Criteria for Assessment and Reporting of Student Achievement

Students should be familiar with the overall Unit Grade Descriptors on the Unit Outline that this assessment contributes towards. Grades are not allocated to individual assessment items. The **overall** Unit Grade will reflect student performance across all assessment items completed for that unit. As deemed relevant for this assessment, students will be provided broad achievement indicators of the four dimensions of the Grade Descriptors:

- Knowledge – knowledge of mathematical facts, techniques and formulae presented in the unit;
- Application – appropriate selection and application of mathematical skills in mathematical modelling and problem solving;
- Reasoning – ability to use reasoning to support solutions and conclusions;
- Communication – interpretation and communication of mathematical ideas in a form appropriate for a given use or audience;

Not all elements of each dimension of the Unit Grade Descriptors are applicable for individual assessment items. The achievement within each of these dimensions will be indicated on the achievement rubric on the following page. There will be a raw mark calculated for this assessment item as per the marking schedule on the following page.

Marks:

Question 1:	/12	Question 2:	/10	Question 3:	/15	Question 4:	/13	Total:	/50
-------------	-----	-------------	-----	-------------	-----	-------------	-----	--------	-----

Scrabble

Scrabble is a game where you form words from letters. Each letter is designated points which are indicated on the tile, here is a video that explains the rules of the game:

<https://www.youtube.com/watch?v=swlg3vQXboE>. The points are designated by how frequently they appear in the English language. The points for each letter and how many of each tile there are displaying in the table below:

Letter	Points
E	1
A	1
O	1
T	1
I	1
N	1
R	1
S	1
L	1
U	1
D	2
G	2
C	3
M	3
B	3
P	3
H	4
F	4
W	4
Y	4
V	4
K	5
J	8
X	8
Q	10
Z	10

The following is an excerpt from the classic book Pride and Prejudice by Jane Austin:

“Lady Catherine has been of infinite use, which ought to make her happy, for she loves to be of use. But tell me, what did you come down to Netherfield for? Was it merely to ride to Longbourn and be embarrassed? or had you intended any more serious consequence?”

Question 1)

- a) Complete this frequency table for the number of times each letter from A-Z appears in this paragraph. (The tally column will not be marked. It is there as a tool if needed) (3 Marks)

Letter	Tally	Frequency
A		
B		
C		
D		
E		
F		
G		
H		
I		
J		
K		
L		
M		
N		
O		
P		
Q		
R		
S		
T		
U		
V		
W		
X		
Y		
Z		
	Total	

- b)** Now use this frequency table to draw a column graph of the results using excel or Google Sheets (An instructional video is on Google Classroom if needed in use of excel and Google Sheets). Paste your graphs in the space provided below. (3 Marks)

- c)** “I noticed that the most common letter (the mode) in the paragraph is the letter E”.

This is one example that can be noted about the data. List at least 3 of your own observations being careful to use mathematical language. (6 Marks)

A free copy of the book, Pride and Prejudice by Jane Austin is posted on Google Classroom along with a digital copy of this assignment. Using Google Documents or Word search tools you can find how many times each letter appears by simply searching for it (this will also be shown in the video mentioned above).

Question 2)

- a) Using the method explained above complete this new frequency table for the number of times each letter from A-Z appears in this entire book. (2 Marks)

Letter	Frequency
A	
B	
C	
D	
E	
F	
G	
H	
I	
J	
K	
L	
M	
N	
O	
P	
Q	
R	
S	
T	
U	
V	
W	
X	
Y	
Z	
Total	

- b)** Now use this frequency table to draw a column graph of the results using excel or Google Sheets. Paste your graphs in the space provided below. (2 Marks)

- c)** List at least 3 observations from this graph in comparison to the graph from Question 1b (i.e. in what ways are they similar and in what ways are they different?). Be careful to use mathematical language. (6 Marks)

Question 3) In scrabble groups letters have the same point value, for example both J and X are worth 8 points.

Points	Letters
1 point	E, A, O, T, I, N, R, S, L, U
2 points	D, G
3 points	C, M, B, P
4 points	H, F, W, Y, V
5 points	K
8 points	J, X
10 points	Q, Z

- a) Create a grouped frequency table for the number of times each group of letters appears in the paragraph provided. (2 Marks)

[illegible]

- b)** Now create a grouped frequency table for the number of times each group of letters appears in the book. (2 Marks)

[illegible]

- c) Using excel or Google Sheets graph both of the tables from Question 3a and b. Paste your graphs in the space provided below. (4 Marks)

d) Make at least 3 observations about the similarities and differences between the two graphs (make sure you refer to the letters that the bars represent). (3 Marks)

e) How does the graph that displays the frequencies of letters in the book relate to the points those letters are worth and are there any exceptions to your observation? (make sure to use the shape of the graph to help in your explanation) (4 Marks)

Question 4) Using your results from previous questions and any other relevant tools discussed in class, design your own point value system for tiles in scrabble. Explain your choices and any other tools used in your decision making. (You **are not** required to assign the number of tiles for each letter)

This question will be graded using the following marking scheme:

<i>Each letter has been assigned value</i>	<i>/2</i>
<i>The values assigned are reasonable</i>	<i>/3</i>
<i>Explanation for assigned values</i>	<i>/4</i>
<i>Originality of assigned values</i>	<i>/4</i>

