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## FURTHER MATHEMATICS VCE UNITS 3&4 DIAGNOSTIC TOPIC TESTS 2016

### TEST 1: CORE – DATA ANALYSIS

TOTAL 30 MARKS (45 MINUTES)

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Student's Name: \_\_\_\_\_ Teacher's Name: \_\_\_\_\_

#### Directions to students

Write your name and your teacher's name in the spaces provided above.

#### SECTION A: MULTIPLE-CHOICE QUESTIONS

##### Instructions for Section A

For each question in Section A, choose the response that is **correct** and circle your choice.

A correct answer scores 1, an incorrect answer scores 0.

Marks will **not** be deducted for incorrect answers.

No marks will be given if more than one answer is completed for any question.

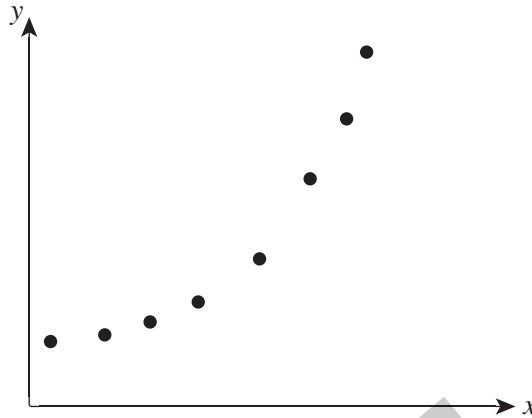
#### Question 1

Which one of the following is best described as a continuous numerical variable?

- A. the scores obtained by a group of students in an ability test
- B. the number of students who are absent through illness each day
- C. the means used by a group of workers to travel to work
- D. the sales of the top ten compact discs
- E. the time taken by a group of workers to travel to work

**Question 7**

The graph below shows some experimental data.

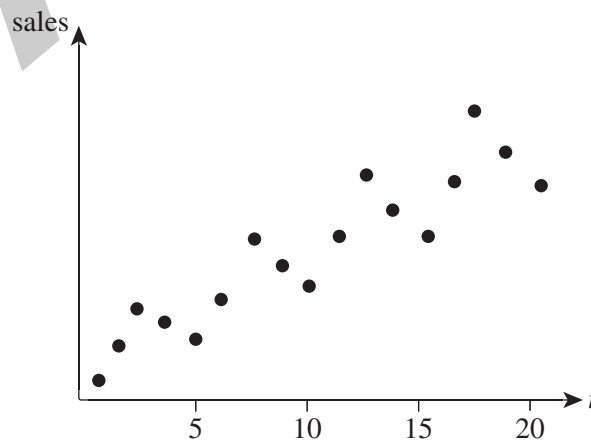


The most likely model for this data is

- A.  $y = mx + c$
- B.  $y = kx^2$
- C.  $y = kx^2 + c$
- D.  $y = \frac{k}{x}$
- E.  $y = k \log_{10} x$

**Question 8**

The data below was obtained by recording the sales of a shop that is open for business from Monday to Saturday.



If the data is to be smoothed using moving averages, the best result would be obtained by taking the data in groups of

- A. 2
- B. 3
- C. 4
- D. 5
- E. 7

**SECTION B: SHORT-ANSWER QUESTIONS**

**Instructions for Section B**

Answer **all** questions in the spaces provided.

**Question 1** (2 marks)

The diagram below shows the age at which a group of mothers had their first child.

1	8 9
2	0 5 6 7 8 9
3	0 1 2 5 6
4	1 4

Find the median and interquartile range of the data.

SAMPLE

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## FURTHER MATHEMATICS VCE UNITS 3&4 DIAGNOSTIC TOPIC TESTS 2016

### TEST 1: CORE – DATA ANALYSIS

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#### SUGGESTED SOLUTIONS AND MARKING SCHEME

##### SECTION A: MULTIPLE-CHOICE QUESTIONS

###### Question 1      E

The time taken by a group of workers to travel to work is a continuous numerical variable. Thus **E** is the correct answer.

- A. discontinuous
- B. discontinuous
- C. nominal
- D. nominal
- E. correct

###### Question 2      B

The graph is a stacked bar chart. The lower part of each stack represents the men, and the upper part represents the women. You need to check each statement by referring to the various sizes of the segments. Note that statement **B** is false because there are more players in the other age groups than in the 20 to 29 group.

It is not necessary to measure the height of the bars in the column graph precisely to verify the correct statements. An approximate measurement suffices to show that women aged 20 to 29 exceeds men aged 10 to 19 (**A**) and that men aged 30 to 39 exceeds men aged 40 to 49 (**C**). Likewise, the column heights of the men and women in the 50 to 59 age group has the men higher.

- A. This can be verified as a correct statement by measurement of the height of the bars in the column graph.
- B. incorrect, thus the correct statement
- C. This can be verified as a correct statement by measurement of the height of the bars in the column graph.
- D. This can be verified as a correct statement by measurement of the height of the bars in the column graph.
- E. This can be verified as a correct statement by measurement of the height of the bars in the column graph.

**SECTION B: SHORT-ANSWER QUESTIONS**

**Question 1** (2 marks)

The quartiles and median are shown in bold:

- 1      8 9
- 2      0 **5** 6 7 8 **9**
- 3      0 1 2 **5** 6
- 4      1 4

median = 29

lower quartile = 25

upper quartile = 35

interquartile range =  $35 - 25 = 10$

A1

A1

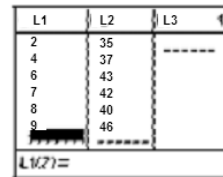
**Question 2** (3 marks)

Using a calculator:

If using a TI-83, first make sure that ‘diagnostics’ are set to ON through the CATALOG. You must press ENTER twice to execute this command.



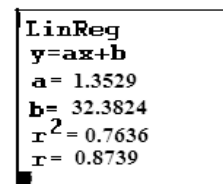
Next, enter the data as two lists under STAT EDIT.



Select STAT CALC followed by OPTION 4 to select linear regression.



The results are displayed:



correlation coefficient = 0.8125 (to four decimal places)

coefficient of determination = 0.6602 (to four decimal places)

About  $100 - 66.42 = 33.58\%$  (to two decimal places) of the variation is due to random fluctuations.

A1

A1

A1