Carlingford High School

Mathematics
Year 10 5.2 Term 2 Test 2019

Student Name: _____

Circle your Teacher below.

Ms. Aung   Mr Cheng   Mrs Lego
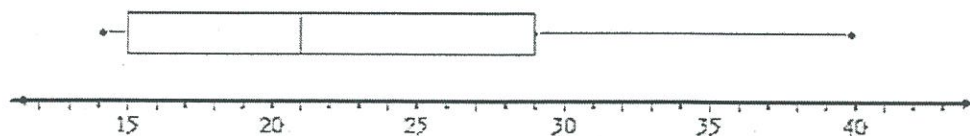
Mr Wilson

*Time allowed: **50 minutes***

- Complete the examination in blue or black pen.
- Show all necessary working.
- Attempt all questions.

	Data Analysis	Consumer Arithmetic	Total	
Questions	/31	/28		
Total	/31	/28	/59	%

Data Analysis

1. (7)

The boxplot represents the ages of 16 people waiting at the bus stop.

Find the following:

a) Range = $40 - 14 = 26$

b) Median (Q2) = 21

c) Upper Quartile (Q3) = 29

d) Lower Quartile (Q1) = 15

e) Interquartile Range = $29 - 15 = 14$

f) What percentage of the people were over the age of 29? 25%

g) How many people were between 15 and 29? $\frac{1}{2} \times 16 = 8$

2. (6)

A back-to-back stem- and- leaf plot shows the amount of cash (in dollars) carried by a sample of year 11 students at Carlingford High School.
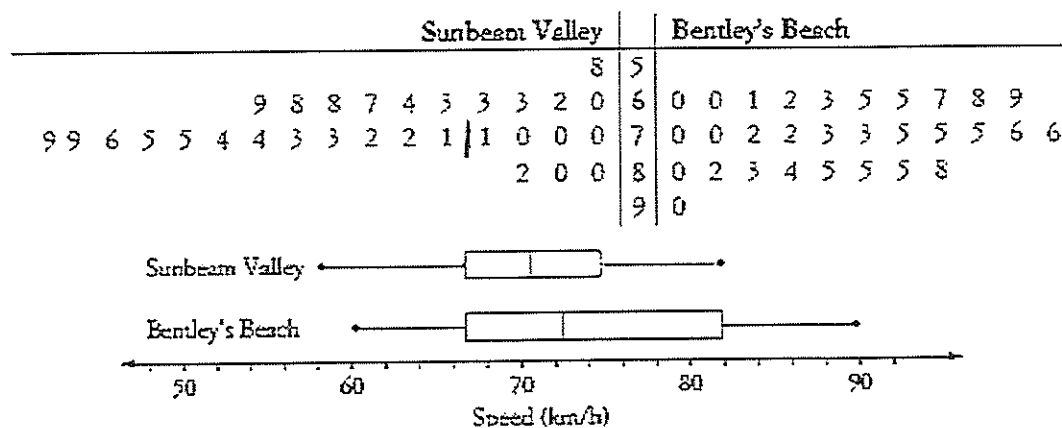
Boys		Girls
5 5 3	0	5 5 6 8 9
8 5 5 2 0	1	0 2 2 5 5 8 8 9
9 6 5 5 5 0 0	2	0 5 6 8 8 8
8 5 5 4 3 2 0 0	3	0 1 4 5 6
5 4 4 2 2 0	4	0 0 5 6
6 6 5 4 3	5	0 3 5
4 2 2	6	5 5 8
5	7	0 4

a) Find the mean amount of cash carried by the girls. $\$31.78$

b) Find the median amount of cash carried by the boys. $\$33.50$

c) Describe the shape of the distribution for the girls. positively skewed

d) Find the lower quartile of the boys. 20

e) Find the upper quartile of the boys. 45

f) What is the inter quartile range of the boys 25

7/
75&85

Busby

3.	The speeds of cars were monitored along a main road in two different suburbs. The results are shown in the back-to-back stem and leaf plot and parallel boxplots.	**(4)**

Sunbeam Valley		Bentley's Beach
8	5	
9 8 8 7 4 3 3 3 2 0	6	0 0 1 2 3 5 5 7 8 9
9 9 6 5 5 4 4 3 3 2 2 1 1 0 0 0	7	0 0 2 2 3 3 5 5 5 6 6
2 0 0	8	0 2 3 4 5 5 5 8
	9	0

Sunbeam Valley

Bentley's Beach

Speed (km/h)

a) What is the median speed of Sunbeam valley? $\dfrac{71+71}{2} = 71$ (1)

b) What is the mode speed for Bentley's Beach? 75 and 85 (1)

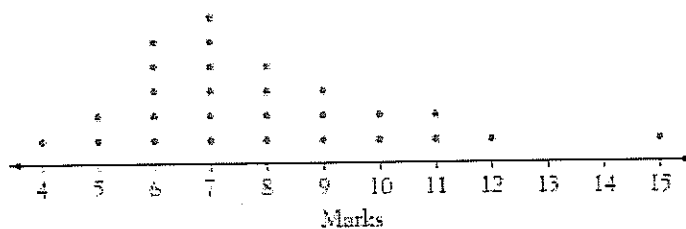(c) In which suburbs do drivers generally drive faster? Give a possible reasons for your answer.

* Bentley's beach ⎤ (1)

* higher median, ⎦

∠ 25% of drivers drive faster that (1)
all drivers in Sunbeam Valley

|		
4.	The results of a maths quiz taken by Year 10 students are displayed below	**(5)**

Marks

a) Find the five point summary for the dot plot { $4, 6, 7, 9, 15$ } (2)

b) What is the outlier, if any? 15 (1)

c) Describe the shape of the dot plot. positively skewed. (1)

d) Find the inter-quartile range. $9 - 6 = 3$ (1)

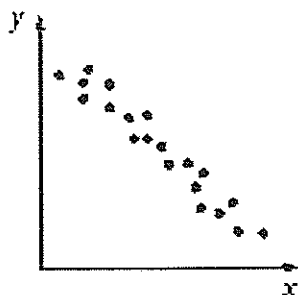| 5.	The number of text messages received per hour by a group of teenagers are displayed below in a frequency histogram and boxplot.	(5)
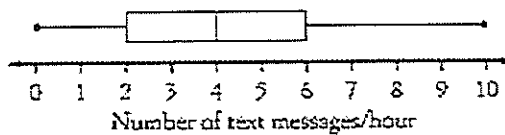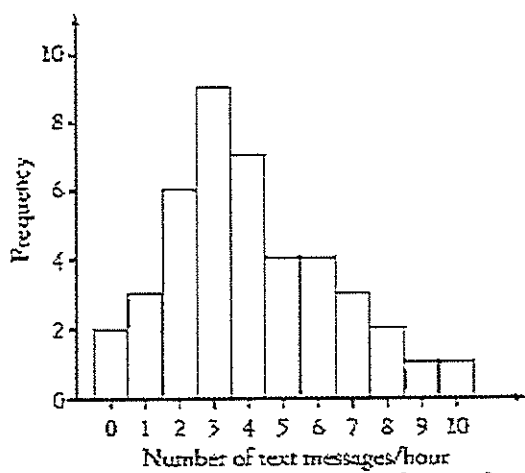
a) How many teenagers received less than three messages? $6 + 3 + 2 = 11$

b) Find the mode. 3

c) Find the range. $10 - 0 = 10$

d) Find the median. 4

e) Find the IQR. $6 - 2 = 4$

6.	The results of a Maths test given to four Year 10 classes are shown below;	(2)

Describe the strength and direction of the scatter plot.

strong, negative relation ✓(1)   (1)

7.		(2)

a) Describe the meaning of *dependent variable*.

A dependent variable depends on the value of another variable (1)

b) Which axis is the independent variable ?

x – axis (1)

	Consumer Arithmetic	28
1	a) i) Calculate the simple interest earned when \$660 is invested for 8 months at 12% p.a.	**(2)**

$$I = P \times R \times V$$
$$= 660 \times 0.12 \times \frac{8}{12}$$
$$= \$52.80$$

ii) Find the final amount of the investment at the end of the 8 months. **(1)**

$$\text{Final Amount} = \$52.80 + 660$$
$$= \$712.80$$

b) The interest charged on a loan of \$25 000 over 5 years is \$4375. Calculate the flat rate of interest. **(2)**

$$R = \frac{I}{PN}$$
$$= \frac{4375}{25000 \times 5}$$
$$= 0.035$$
$$= 3.5\%$$

c) i) Find the total amount of the investment if \$2500 is invested at $7\cdot3\%$ p.a. for 3 years with interest compounded annually. **(2)**

$$A = P(1+r)^n$$
$$= 2500(1 + 0.073)^3$$
$$= \$3058.44$$

ii) Calculate the compound interest earned. **(1)**

$$CI = \$3058.44 - \$2500$$
$$= \$558.44$$

d) Find the amount of **interest earned** if $3500 is invested for 4 years at 7% p.a. interest, where interest is **compounded quarterly**. **(3)**

$$r = 7 \div 4 = 1.75 \qquad n = 4 \times 4 = 16$$
$$= 0.0175$$
$$A = P(1+r)^n$$
$$= 3500(1 + 0.0175)^{16}$$
$$= \$4619.75 \qquad \therefore \text{Interest earned} = 4619.75 - 3500$$
$$= \$1119.75$$

e) Henry has $5000 in an account earning 14% p.a. interest, compounded yearly. How long will it take for him to double his money (correct to the nearest month)? **(3)**

$$10000 = 5000(1 + 0.14)^n$$
$$2 = 1.14^n$$

$$n = \frac{\ln 2}{\ln 1.14}$$
$$= 5.29$$
5 years | 3 mths

$$1.14^4 = 1.69$$
$$1.14^5 = 1.92$$
$$1.14^6 = 2.19$$
$$1.14^{5.3} = 2.00 \dots$$

Take 5 years 3 mths
5 years 4 mths

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2   Angela's car is now worth $8 670. A year ago it was worth $10 200.

(i) Show that the car has depreciated 15% during that year. **(1)**

$$A = P(1-r)^n$$
$$8670 = 10\,200(1 - r)^1$$
$$1 - r = \frac{8670}{10200} \qquad \therefore r = 1 - \frac{8670}{10200}$$
$$= 0.15 = 15\%$$

(ii) Angela sells her car after a further four years. If the car continues to depreciate at the same rate (15% p.a.), determine its value when she sells it. **(2)**

$$A = 10200(1 - 0.15)^4$$
$$= \$4525.79$$

(iii) What is the depreciation over the 5 years? **(1)**

$$\text{Total depreciation} = \$10,200 - \$4525.79$$
$$= \$5674.21$$

3 Ian purchases a new plasma TV valued at $4000 by paying a 20% deposit and repaying the balance in equal monthly instalments over 2 years at a flat interest rate of 8.5% p.a.

Calculate:

a) the amount of deposit paid. **(1)**

$$deposit = \frac{20}{100} \times 4000 = \$800$$

b) and the amount of balance owing. **(1)**

$$Amount\ owing = \$4000 - \$800$$
$$= \$3200.$$

c) the interest charged on the balance. **(1)**

$$I = \frac{8.5}{100} \times 3200 \times 2$$
$$= \$544$$

d) the total to be repaid. **(1)**

$$Total\ to\ be\ repaid = 3200 + 544$$
$$= \$3744$$

e) the amount of each monthly installment. **(1)**

$$Monthly\ installment = \$3744 \div 24$$
$$= \$156$$

f) the total amount paid for the TV. **(1)**

$$Total\ Amount = 4000 + 544$$
$$= \$4544$$

4	Peter purchases a new refrigerator for $1900 on a deferred payment plan. He chooses a deferred payment plan over 2 years. They make no repayments for the first six months, then pay $135 per month	
	a) Calculate the total repayments. Total repayment = $135 × 18 = $2430	(1)
	b) How much interest did he pay? $T = 2430 - 1900$ $= 530$	(1)
	c) What percentage of the purchase price is paid in interest? $\% \, I = \dfrac{530}{1900} \times 100$ $= 27.89\%$	(2)

End of Examination