Carlingford High School

Mathematics

Year 10 (5.1) Term 2 Exam

2018

Name: _____

Time allowed: 50 minutes

- Answer all questions in the spaces provided
- All questions are worth 1 mark unless otherwise stated
- Complete the examination in blue or black pen
- Draw diagrams using pencil and a ruler

Data Analysis	**/46**	
Simple and Compound Interest	**/29**	
Total	**/75**	**%**

Data Analysis

Question 1 (6 marks)

8, 21, 21, 21, 23, 24, 25, 25

For this set of data, find the:

(a) Mode _____

(b) Range _____

(c) Median _____

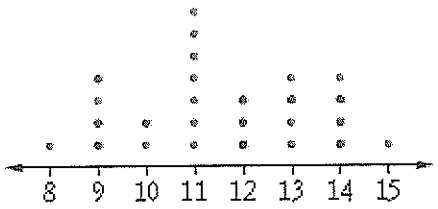
(d) Mean (1 decimal place) _____

(e) Outlier _____

(f) Mean if the outlier is removed (1 d.p.)

_____

Question 2 (4 marks)



For the data presented in this dot plot, find the:

(a) Mode _____

(b) Range _____

(c) Median _____

(d) Mean (1 decimal place) _____

Question 3 (3 marks)

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

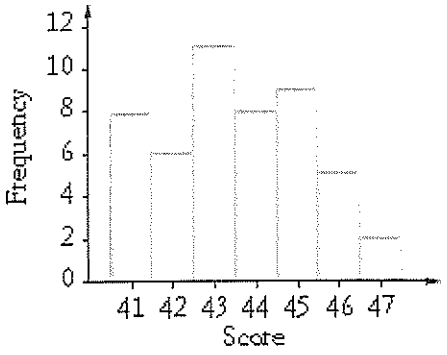
For the data presented in this stem-and-leaf plot, find the:

(a) Highest score _____

(b) Mode _____ and _____

(c) Range _____

Question 4 (5 marks)



(a) This graph is called a frequency

_____

(b) How many times does the number 45 occur?

_____

(c) The range is equal to _____

(d) How many different scores are there?

_____

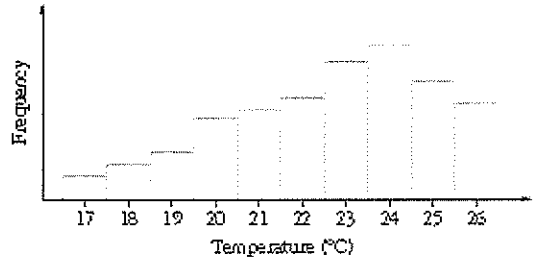
(e) How many scores are there?

_____

Question 5 (3 marks)

Write *symmetric*, *skewed* or *bimodal* under the graph with that shape.

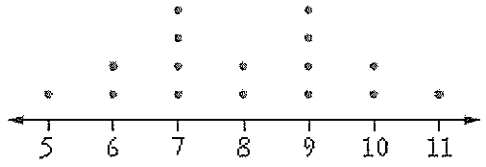
(a)



(b)

Stem	Leaf
10	4 5
11	3 4 4 9
12	1 2 2 6 8
13	0 1 5 5 7 9 9 9
14	4 5 6 8 8
15	0 0 1 1
16	0 2

(c)



Question 6 (4 marks)

This back-to-back stem-and-leaf plot compares the assignment marks of two Maths classes.

10 Green					10 Yellow			
				5	4	4	8	
			9	6	5	7	8	8
		8	5	2	7	2	4	7	8
6	6	5	4	2	8	4			
		8	3	1	9				

(a) What is the highest mark scored?

(b) The median of 10 Yellow's scores is 68. What is 10 Yellow's lower quartile?

(c) What is the difference between the two ranges?

[2 marks]

Question 7 (2 marks)

(a) Which of the following is a measure of spread?

(A) Mean (B) Sample (C) Range

(b) Which of the following is most affected by an outlier?

(A) Mean (B) Mode (C) Median

Question 8 (4 marks)

28	32	36	26	42	78
38	46	32	45	37	36

(a) Rewrite these scores in order from smallest to largest.

____ ____ ____ ____ ____ ____

____ ____ ____ ____ ____ ____

(b) Range = _____

(c) Interquartile Range =

_____

(d) Why is the interquartile range the best measure of spread for this set of scores?

_____

_____

Question 9 (7 marks)

mean, median, interquartile range, skewed, polygon, frequency

Use one of the above words to complete each sentence.
(Marks will be deducted for incorrect spelling)

(a) The _____ is the difference between the upper and lower quartiles.

(b) _____ = $\frac{sum\ of\ fx}{sum\ of\ f}$

(c) The shape of a set of data is

_____ when the scores are clustered at one end.

(d) A frequency _____ is a line graph that shows the frequency of each score, drawn by joining the middle of the top of each column in a histogram.

(e) _____ = $\frac{sum\ of\ scores}{number\ of\ scores}$

(f) The cumulative _____ column is a running total of frequencies. It is used to find the

_____

Question 10 (6 marks)

Score	Frequency	*fx*	Cumulative Frequency
0	6		6
1	3		
2		10	
3	4		
4	9		
5	2		
Total			

(a) Complete the frequency column.

(b) Complete the *fx* column.

(c) Complete the cumulative frequency column.

(d) Calculate the mean, correct to 1 decimal place.

_____

(e) Find the mode. _____

(f) Find the median. _____

Simple and Compound Interest

Question 1 (3 marks)

Change each percentage to a decimal:

(a) $52\% =$ _____

(b) $2\% =$ _____

(c) $120\% =$ _____

Question 2 (3 marks)

Change each decimal to a percentage:

(a) $0 \cdot 34 =$ _____%

(b) $0 \cdot 8 =$ _____%

(c) $2 \cdot 22 =$ _____%

Question 3 (5 marks)

Use $I = PRN$ to calculate the simple interest on:

(a) \$500 at 5%p.a. for 5 years

$I = 500 \times 5\% \times 5$

$Interest =$ \$_____

(b) \$975 at 1.5%p.a. for 2 years

$Interest =$ _____

= _____

[2 marks]

(c) \$1600 at 3%p.a. for 8 months

$I = 1600 \times 0 \cdot 03 \times$ _____

$Interest =$ \$_____

[2 marks]

Question 4 (2 marks)

Solve for N:

$$\$2795 = \$2000 \times 21.5\% \times N$$

$N =$ _____ years

Question 5 (5 marks)

The cash price of a new car was \$12500. To buy it on terms, 15% of the cash price was needed for the deposit, plus monthly payments of \$210 for 5 years.

(a) Calculate the deposit.

_____

(b) How many monthly payments were made?

_____

(c) What was the total of the monthly payments?

_____

(d) How much did the car cost to buy on terms?

_____

(e) How much interest was charged?

_____

Question 6 (2 marks)

$4000 was invested at 4%p.a. compounded annually for two years.

Complete the table to find the value of the investment at the end of 2 years.

Year	Principal	Interest	Principal + Interest
1	$4000	$160	$4160
2	$_____	$_____	$_____

[2 marks]

Question 7 (2 marks)

$4000 was invested at 4%p.a. compounded annually for two years.

a) Use $A = P(1 + R)^n$ to calculate the final amount.

$$A = \$4000 \times (1 + 0 \cdot 04)^2$$

Amount = $_____

b) Interest = $_____

Question 8 (2 marks)

$4000 was invested at 4%p.a. compounded monthly for two years.

a) Use $A = P(1 + R)^n$ to calculate the final amount.

$A = \$4000 \times (1 + $ _____ $)$____

Amount = $_____

[2 marks]

Question 9 (5 marks)

Complete each sentence with a word from this test paper:

a) Interest calculated on the original principal is called

_____ interest.

b) A method of paying for an expensive item, by making regular partial payments over a period of time, and interest, is called

_____ payments.

c) An initial down payment, before regular term payments begin, is called a

_____.

d) _____ interest is calculated on the principal, plus any interest added previously.

e) The *R* in the formula $I = PRN$ stands for the interest

_____.

Extension Problems

Data Analysis (2 marks)

The mean of nine numbers is 15. When two more numbers are added to the data set, the mean increases to 17.
What two numbers could have been added?

_____

_____

_____

[2 marks]

Simple Interest (2 marks)

You have $5000 to invest. The best rate you can find is 9.375%p.a. simple interest.
How long will it take for this amount to double?
(Give your answer in years and months)

_____

_____

_____

[2 marks]

END OF TEST

Carlingford High School

Mathematics

Year 10 (5.1) Term 2 Exam

2018

Name: SOLUTIONS

Time allowed: 50 minutes

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Data Analysis	**/46**	
Simple and Compound Interest	**/29**	
Total	**/75**	**%**

Data Analysis

Question 1 (6 marks)

8, 21, 21, 21, 23, 24, 25, 25

For this set of data, find the:

(a) Mode 21 ✓

(b) Range 25 - 8 = 17 ✓

(c) Median $\frac{21+23}{2}$ = 22 ✓

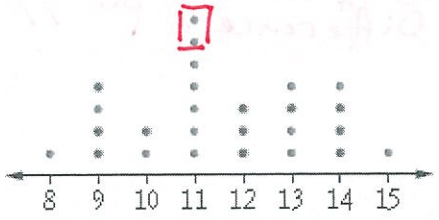
(d) Mean ~~(1 decimal place)~~ $\frac{168}{8}$ = 21 ✓

(e) Outlier 8 ✓

(f) Mean if the outlier is removed (1 d.p.)

$\frac{160}{7}$ = 22.9 ✓

Question 2 (4 marks)



For the data presented in this dot plot, find the:

(a) Mode 11 ✓

(b) Range 15 - 8 = 7 ✓

(c) Median 11 ✓

(d) Mean (1 decimal place) $\frac{300}{26}$ = 11.5 ✓

$$\frac{8 + 4\times9 + 2\times10 + 7\times11 + 3\times12 + 4\times13 + 4\times14 + 15}{26}$$

Question 3 (3 marks)

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

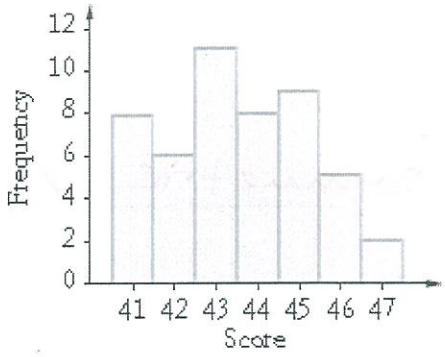
For the data presented in this stem-and-leaf plot, find the:

(a) Highest score 58 ✓

(b) Mode 24 and 35 ✓

(c) Range 58 - 10 = 48 ✓

Question 4 (5 marks)



(a) This graph is called a frequency

histogram ✓.

(b) How many times does the number 45 occur?

9 ✓

(c) The range is equal to 47 - 41 = 6 ✓

(d) How many different scores are there?

7 ✓

(e) How many scores are there?

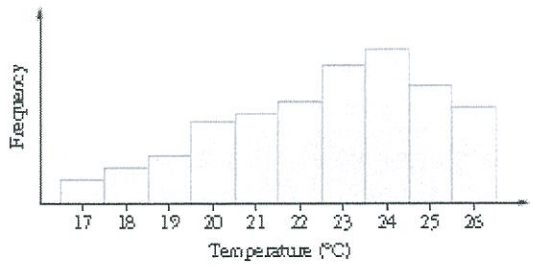
8 + 6 + 11 + 8 + 9 + 5 + 2

= 49 ✓

Question 5 (3 marks)

Write *symmetric*, *skewed* or *bimodal* under the graph with that shape.

(a)



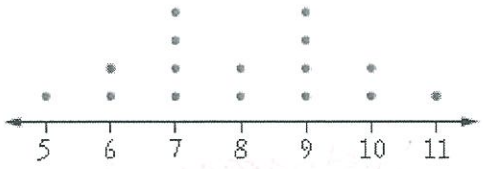
skewed ✓

(b)

Stem	Leaf
10	4 5
11	3 4 4 9
12	1 2 2 6 8
13	0 1 5 5 7 9 9 9
14	4 5 6 8 8
15	0 0 1 1
16	0 2

symmetric ✓

(c)



bimodal ✓

or

symmetric

Question 6 (4 marks)

This back-to-back stem-and-leaf plot compares the assignment marks of two Maths classes.

10 Green		10 Yellow
	5	4 4 8
9	6	5 7 8 8
8 5 2	7	2 4 7 8
6 6 5 4 2	8	4
8 3 1	9	

(a) What is the highest mark scored?

98 ✓

(b) The median of 10 Yellow's scores is 68. What is 10 Yellow's lower quartile?

$\frac{58+65}{2} = 61.5$ ✓

(c) What is the difference between the two ranges?

10G: 98 − 69 = 29

10Y: 84 − 54 = 30

Difference = 1 ✓✓

[2 marks]

Question 7 (2 marks)

(a) Which of the following is a measure of spread?

(A) Mean (B) Sample (C) Range ✓

(b) Which of the following is most affected by an outlier?

(A) Mean (B) Mode (C) Median

✓

Question 8 (4 marks)

28 32 36 26 42 78
38 46 32 45 37 36

(a) Rewrite these scores in order from smallest to largest.

26 28 32 32 36 36
37 38 42 45 46 78 ✓

(b) Range = 78 − 26 = 52 ✓

(c) Interquartile Range =

43.5 − 32 = 11.5 ✓

(d) Why is the interquartile range the best measure of spread for this set of scores?

Because there is an outlier. ✓

Question 9 (7 marks)

mean, median, interquartile range, skewed, polygon, frequency

Use one of the above words to complete each sentence.
(Marks will be deducted for incorrect spelling)

(a) The interquartile range. ✓ is the difference between the upper and lower quartiles.

(b) Mean ✓ = $\frac{sum\ of\ fx}{sum\ of\ f}$

(c) The shape of a set of data is

skewed ✓ when the scores are clustered at one end.

(d) A frequency polygon ✓ is a line graph that shows the frequency of each score, drawn by joining the middle of the top of each column in a histogram.

(e) Mean ✓ = $\frac{sum\ of\ scores}{number\ of\ scores}$

(f) The cumulative frequency ✓ column is a running total of frequencies. It is used to find the median ✓

Question 10 (6 marks)

Score	Frequency	*fx*	Cumulative Frequency
0	6	0	6
1	3	3	9
2	5	10	14
3	4	12	18
4	9	36	27
5	2	10	29 ✓
Total	29 ✓	71 ✓	

(a) Complete the frequency column.

(b) Complete the *fx* column.

(c) Complete the cumulative frequency column.

(d) Calculate the mean, correct to 1 decimal place.

$\frac{71}{29}$ = 2.4 ✓

(e) Find the mode. 4 ✓

(f) Find the median. 3 ✓

Simple and Compound Interest

Question 1 (3 marks)

Change each percentage to a decimal:

(a) 52% = 0.52 ✓

(b) 2% = 0.02 ✓

(c) 120% = 1.2 ✓

Question 2 (3 marks)

Change each decimal to a percentage:

(a) $0 \cdot 34 =$ 34 ✓ %

(b) $0 \cdot 8 =$ 80 ✓ %

(c) $2 \cdot 22 =$ 222 ✓ %

Question 3 (5 marks)

Use $I = PRN$ to calculate the simple interest on:

(a) \$500 at 5%p.a. for 5 years

$I = 500 \times 5\% \times 5$

$Interest =$ \$125 ✓

(b) \$975 at 1.5%p.a. for 2 years

$Interest =$ \$975 × 1.5% × 2 ✓

= \$29.25 ✓

[2 marks]

(c) \$1600 at 3%p.a. for 8 months

$I = 1600 \times 0 \cdot 03 \times$ 8/12 ✓

$Interest =$ \$32 ✓

[2 marks]

(\$384 1 mk)

Question 4 (2 marks)

Solve for N:

$\$2795 = \$2000 \times 21.5\% \times N$

$\frac{2795}{2000 \times 0.215} = N$ ✓ for working

$N =$ 6.5 years ✓

Question 5 (5 marks)

The cash price of a new car was \$12500. To buy it on terms, 15% of the cash price was needed for the deposit, plus monthly payments of \$210 for 5 years.

(a) Calculate the deposit.

15% × \$12500 = \$1875 ✓

(b) How many monthly payments were made?

5 × 12 = 60 months ✓

(c) What was the total of the monthly payments?

60 × \$210 = \$12600 ✓

(d) How much did the car cost to buy on terms?

(a) + (c)

\$1875 + \$12600 = \$14475 ✓

(e) How much interest was charged?

\$14475 − \$12500 = \$1975 ✓

(d) − 12500

Question 6 (2 marks)

$4000 was invested at 4%p.a. compounded annually for two years.

Complete the table to find the value of the investment at the end of 2 years.

Year	Principal	Interest	Principal + Interest
1	$4000	$160	$4160
2	$ 4160	4% × 4160 $ 166.40	$ 4326.40

[2 marks]

Question 7 (2 marks)

$4000 was invested at 4%p.a. compounded annually for two years.

a) Use $A = P(1 + R)^n$ to calculate the final amount.

$$A = \$4000 \times (1 + 0 \cdot 04)^2$$

Amount = $ 4326.40

b) Interest = $ 326.40

Question 8 (2 marks)

$4000 was invested at 4%p.a. compounded monthly for two years.

a) Use $A = P(1 + R)^n$ to calculate the final amount.

$A = \$4000 \times (1 + \frac{4\%}{12})^{24}$

Amount = $ 4332.57

[2 marks]

Question 9 (5 marks)

Complete each sentence with a word from this test paper:

a) Interest calculated on the original principal is called

simple interest.

b) A method of paying for an expensive item, by making regular partial payments over a period of time, and interest, is called

term payments.

c) An initial down payment, before regular term payments begin, is called a

deposit.

d) compound interest is calculated on the principal, plus any interest added previously.

e) The R in the formula $I = PRN$ stands for the interest

rate (interest rate).

Extension Problems

Data Analysis (2 marks)

The mean of nine numbers is 15. When two more numbers are added to the data set, the mean increases to 17.
What two numbers could have been added?

Total = $9 \times 15 = 135$

$\frac{135 + x}{11} = 17$

$x + 135 = 187$

$x = 52$

[2 marks]

∴ Any two numbers that add to 52.

eg. 26 and 26.

✓ working. ✓ (answer).

Simple Interest (2 marks)

You have $5000 to invest. The best rate you can find is 9.375%p.a. simple interest.
How long will it take for this amount to double?
(Give your answer in years and months)

$\$5000 = \$5000 \times 9.375\% \times N$ ✓

$N = \frac{1}{0.09375} = 10.666\ldots$

$= 10$ years 8 months. ✓

[2 marks]

END OF TEST