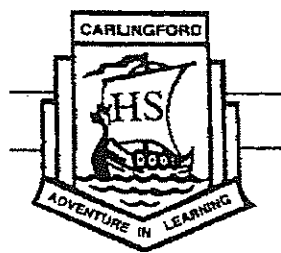


Carlingford High School



Mathematics Year 10 5.2 Term 2 Exam 2018

Student Name: Solutions — Hooper

Class: 10MA2 _____

Time allowed: **50 minutes**

- Complete the examination in blue or black pen.
- Show all necessary working.
- Attempt all questions.
- Extension questions are marked with an asterisk *.

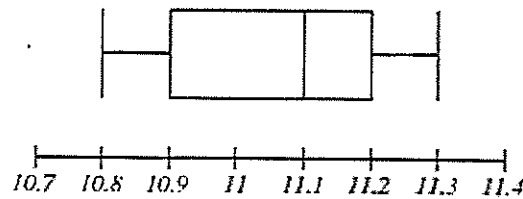
	Data Analysis	Compound Interest	Total	
Standard	/29	/24	/53	
Extension	/8	/3	/11	
Total	/37	/27	/64	%

Data Analysis

Marks

1.

(5)



The above graph shows the times, in seconds, for a 100m sprint race. Find the:

a) Range $11.3 - 10.8 = 0.5$

b) Median 11.1

c) Upper Quartile (Q3) 11.2

d) Lower Quartile (Q1) 10.9

e) Interquartile Range $11.2 - 10.9 = 0.3$

①

①

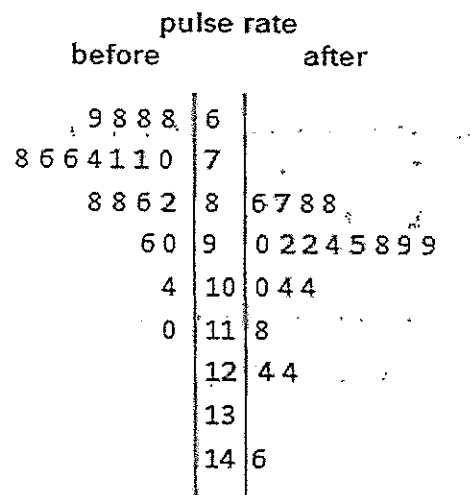
①

①

①

2. A back-to-back stem and leaf plot, showing pulse rates (in beats per minute) of PE students before and after exercise, is given below.

(5)



a) What is the mode pulse rate before exercise? 68

b) What is the median pulse rate before exercise? 76

c) What is the mean pulse rate after exercise, correct to 1 decimal place?

(rounding) $\bar{x} = \frac{1928}{19} = 101.5$ (to 1 dec pl)


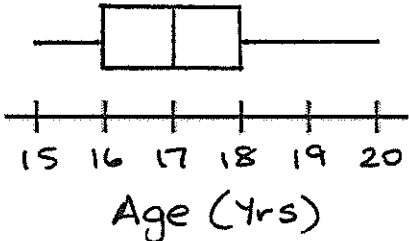
d) What is the outlier? 146

①

①

①

①

	<p>e) Which of the measures of central tendency (<i>mean, median or mode</i>) is most affected by this outlier?</p> <p style="text-align: center;"><u>mean</u></p>	①
3.	<p>The graph below shows the number of hours spent by Year 7 students on homework each week.</p>  <p style="text-align: center;">hours spent on homework per week</p> <p>a) What type of graph is this? <u>dot plot</u></p> <p>b) Is this graph <i>symmetric, skewed or bimodal</i>? <u>skewed</u></p> <p>(c) Find the mode of the distribution? <u>1 hr</u></p>	<p>(3)</p> <p>①</p> <p>①</p> <p>①</p>
4.	<p>The oldest person in an under 21's soccer team is 20 and the youngest person is 15. The median age of the soccer team is 17, the lower quartile is 16, and the upper quartile is 18.</p> <p>a) Represent this information with a box-and-whisker plot on the axis below.</p> <p style="text-align: center;">u 21's Soccer Team</p>  <p style="text-align: center;">Age (Yrs)</p> <p>extension → (*b) What percentage of soccer players are aged between mark</p> <p>i) 16 and 18? <u>50 %</u></p> <p>ii) 16 and 20? <u>75 %</u></p>	<p>(4)</p> <p>← ② marks</p> <p>①</p> <p>①</p>

5. The following scores are marks in a test out of 50 obtained by a group of 11 students.

(6)

22 25 30 31 36 37 42 46 31 27 16

a) Display the data in an **ordered** stem and leaf plot.

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

① correct order

② lined up vertically

← ② marks

b) Find the mean, correct to 1 decimal place.

$$\bar{x} = \frac{343}{11} = 31.2 \text{ (to 1 dec pl)}$$

①

c) Find the median.

16 22 $\overset{Q_1}{(25)}$ 27 30 $\overset{Q_2}{(31)}$ 31 36 $\overset{Q_3}{(37)}$ 42 43

31

①

d) Find the lower quartile.

25

①

e) Write the 5-number summary for this data.

16 25 31 37 46

①

* strict marking

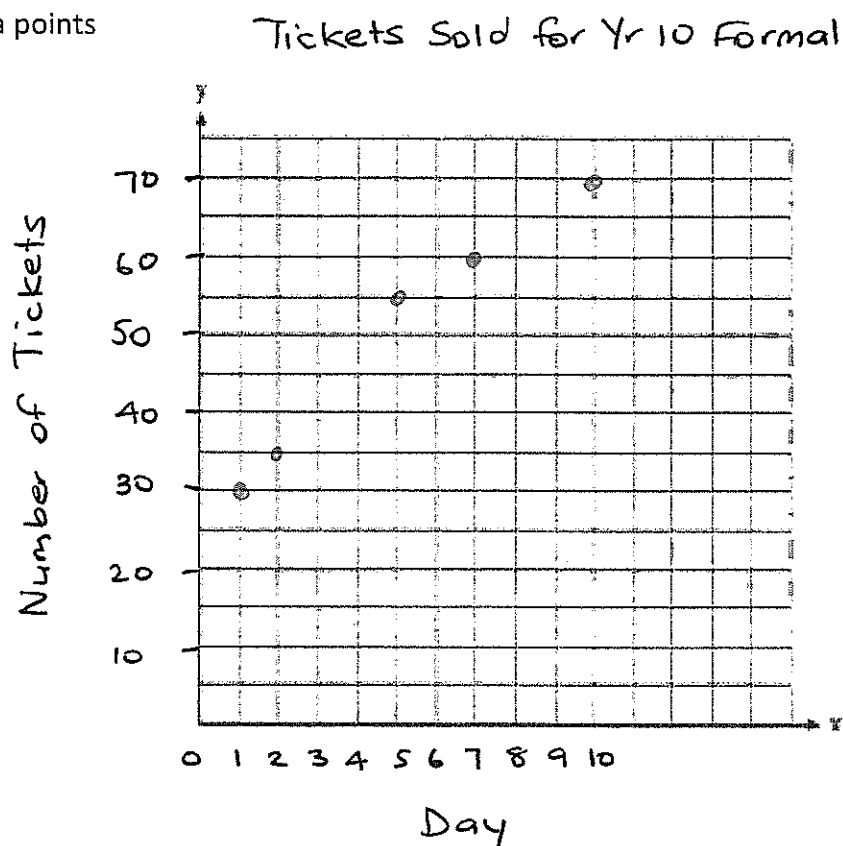
6. The table below shows the number of tickets sold each day for the Year 10 formal over a 10-day period.

Day(x)	1	2	5	7	10
Number of tickets sold(y)	30	35	55	60	70

a) i) Mark and label the x-axis correctly.

ii) Mark and label the y-axis correctly.

iii) Plot all data points



b) Describe the *strength* and *direction* of the relationship between the two variables.

Strong

Positive

(5)

①

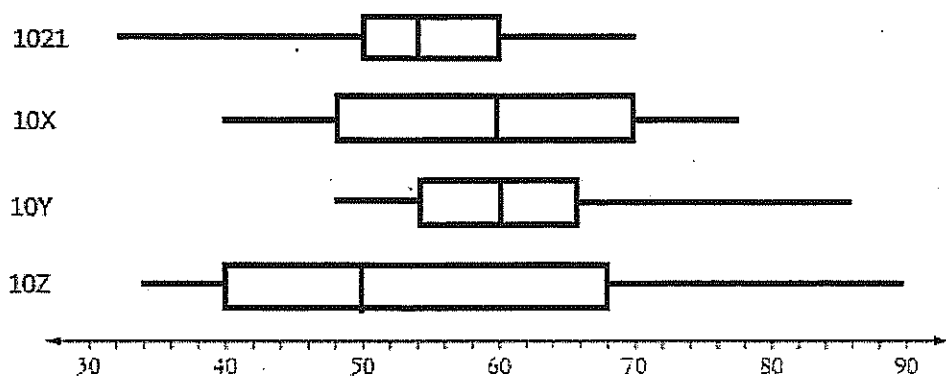
①

①

②

*7. The results of a Maths test given to four Year 10 classes are shown below;

(*6)



a) For which of the classes are the test results:

i. Negatively skewed? 1021

ii. Symmetrical? 10X

①

①

b) Which class has the lowest overall results? Give a reason for your answer.

① 10Z has the lowest overall results as it has the lowest median of all classes ①

c) 10X and 10Y have the same range. Which class has a larger spread of test results? Give a reason for your answer.

① 10X has a larger spread of test results as it has a larger interquartile range ①

8. a) What is represented by the whiskers on a box-and-whisker plot?

(3)

lowest 25% and highest 25% of scores

①

b) Describe a set of data which is skewed.

Most of the data is bunched/clustered at the lower scores

①

c) What type of graph is used to represent bivariate data?

Scatter Graph or Line Graph

①

Consumer Arithmetic

1

- a) Find 6.25% of \$1200.

(5)

$$\frac{6.25}{100} \times \$1200 = \$75$$

(1)

- b) Calculate the simple interest on \$700 over 7 months at 0.007% per month.

$$I = \$700 \times \frac{0.007}{100} \times 7 = \$0.34 \text{ (to nearest cent)}$$

(1)

- c) The interest on \$16 240, invested at 4.8% p.a. over 5 years, is calculated to be \$3897.60. Find the value of the investment after 5 years.

$$Inv = (\$16240 \times \frac{4.8}{100} \times 5) + \$16240 = \$20317.60$$

(1)

- d) A television, on sale for \$8790, is bought on terms. Calculate the dollar amount of a 15% deposit.

$$Dep = \frac{15}{100} \times \$8790 = \$1318.50$$

(1)

- e) Ken makes repayments of \$62 per month for his computer. How much does he repay in 4 years?

$$Tot \text{ Repay} = \$62 \times 48 = \$2976$$

(1)

2.

- a) Calculate the simple interest on an investment of \$5000 invested for 3 years at a rate of 5% p.a.

(5)

$$I = \$5000 \times 0.05 \times 3$$

$$= \$750$$

(2)

- b) Use $A = P(1 + R)^n$ to calculate the compound interest earned on the investment in part a).

$$A = \$5000 (1 + 0.05)^3$$

$$A = \$5788.13 \text{ (to nearest cent)}$$

(2)

- c) If interest is calculated by compounding quarterly, would the investment earn more or less interest than compounding annually?

More

(1)

*3.	<p>After 5 years an investment has increased from \$3500 to \$8000. Calculate the simple interest rate per annum at which the principal was invested, correct to one decimal place</p> $\underline{\$4500 = \$3500 \times r \times 5}$ $\underline{\frac{\$4500}{\$17500} = \frac{\$17500 \times r}{\$17500}}$ $\underline{0.2571428... = r}$ $\underline{25.7\% = r \text{ (to 1 dec pl)}}$	(*3)
4.	<p>Sam bought a car at the beginning of May 2013 for \$19 990. If the car depreciates at 18% per year since it was purchased, use $A = P(1 - R)^n$ to calculate the value of the car at the beginning of May 2018? (Write your answer correct to the nearest dollar)</p> $\underline{A = \$19\,990 (1 - 0.18)^5}$ $\underline{A = \$7377.72288...}$ $\underline{A = \$7378 \text{ (to nearest dollar)}}$	(2)
5.	<p>Joe purchased a new fridge and dishwasher package valued at \$3200. He pays a 15% deposit and repays the balance over 48 months at a flat rate of 7.5% p.a. interest.</p> <p>a) Deposit = $\underline{\frac{15}{100} \times \\$3200}$ $\underline{= \\$480}$</p> <p>b) Balance owing = $\underline{\\$3200 - 480}$ $\underline{= \\$2720}$</p> <p>c) Interest owing on the balance = $\underline{\\$2720 \times 0.075 \times 4}$ $\underline{= \\$816}$</p> <p>d) Total repayment, including interest = $\underline{\\$2720 + 816}$ $\underline{= \\$3536}$</p>	(6)

	<p>e) Amount of each monthly installment = $\frac{\\$ 3536}{48}$ $= \\$ 73.67$ (to nearest cent)</p> <p>f) Total amount paid for the entire package = $\\$ 3536 + 480$ $= \\$ 4016$</p>	<p>①</p> <p>①</p>
6.	<p>Chris purchases a new computer, valued at \$900, on a deferred payment plan, where he puts down a deposit of 10% and then pays \$110 per month for 9 months.</p> <p>a) Calculate the amount of the deposit. $Dep = 0.10 \times \\$900$ $= \\$90$</p> <p>b) Calculate the total of the monthly repayments. $Tot\ Repay = 9 \times \\$110$ $= \\$990$</p> <p>c) How much more has Chris paid for the computer by buying it on a payment plan. $Extra = (\\$90 + 990) - 900$ $= \\$180$</p>	<p>(3)</p> <p>①</p> <p>①</p> <p>①</p>
7.	<p>a) When investing, why does compound interest earn more than simple interest? <u>Compound interest earns interest on the interest plus principal. Simple interest is calculated on the principal only.</u></p> <p>b) What does the R stand for in the formula $A = P(1 + R)^n$? <u>Interest rate as a decimal/fraction</u></p> <p>c) What word means a decrease in the value of an item over time? <u>Depreciation</u></p>	<p>(3)</p> <p>①</p> <p>①</p> <p>①</p>