Mathematics Essentials 2015
Unit 2: Test 1
Task Weighting: 13%

Eastern Goldfields College

Student Name: SOLUTIONS

Time Allowed: 45 Minutes Total Marks: 45

Calculators and files are allowed in this test.

Answer all of the following questions. Show all working to maximise marks.

Question 1 [5 Marks: 1, 1, 1, 1, 1]

From the lists of data displays and data types below, complete the table by choosing the most appropriate Data Display and Data Type.

Data Displays
- Column graph
- Dot frequency diagram
- Back to back stem and leaf diagram
- Histogram
- Pie

Data Types
- Numerical
- Categorical

4 must have.

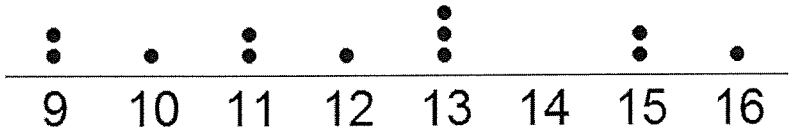
	Data Display	Data Type
The heights (measured in cm) of 20 boys and 20 girls to compare them.	Back to Back S/Leaf (2) Histograms	Numerical
The eye colour of all Year 11 students.	~~Dot frequency~~ Column/Pie	Categorical
The foot length, measured in cm, of the members of your class	Histogram	Numerical
The percentage of students in each year at our school.	Column, Pie	Categorical
The birth month of all Essentials students.	Column, Pie ~~Dot Freq.~~	Categorical

½ each box

Question 2 [6 marks: 1, 1, 1, 2, 1]

This dot plot shows the number of motor vehicle thefts in the Goldfields region of Western Australia recorded each month for one year.

Number of vehicles stolen
per month in the Goldfields



a) Calculate the range of the scores, showing your working.

$16 - 9\frac{1}{2} = 7\frac{1}{2}$ ✓

b) Determine the mode. 13 ✓

c) Determine the median. 12.5 ✓

d) Calculate the mean, showing your working.

$147 \div 12 = 12.25$ ✓✓

e) Complete this sentence:
For the Goldfields region, you would expect approximately 13 ✓ vehicles stolen within a month.

Question 3 [4 marks: 2, 2]

Two classes are marked on the same tests.

- Class P has a mean of 65% and standard deviation of 5.
- Class Q has a mean of 50% and standard deviation of 15.

a) Write a statement comparing the scores of the two classes, who had the better scores and why?

✓Class P as most students were scoring around 65%. ✓
Results grouped around 65%

b) Write a statement comparing the spread of the scores for the two classes and why.

Class Q has a greater spread as SD is higher ✓

Question 4 [17 marks: 2, 2, 3, 6, 4]

Consider the data to the right, showing the heights of 20 male and 20 female Year 7 students, taken from CensusAtSchool.

Height (cm) Year 7 students

Female	Male
106	141
142	142
143	148
144	148
147	149
147	149
152	150
152	150
153	154
153	154
155	156
155	156
157	156
160	158
162	159
164	164
165	165
170	169
172	170
176	170

a) Circle or highlight any outliers in the data.

i. For any you find, explain why you consider it an outlier.

106 is much smaller than the rest of the heights

b) Explain the effect the outlier(s) have on the:

i. Mean

The outlier decreases the mean.

ii. Median

No effect.

c) Make a back-to-back stem and leaf diagram to display this data.

Female		Male
6	10	
	11	
	12	
	13	
7 7 4 3 2	14	1 2 8 8 9 9
7 5 5 3 3 2 2	15	0 0 4 4 6 6 6 8 9
5 4 2 0	16	4 5 9
6 2 0	17	0 0

d) Complete the table below, showing your working, to summarize the statistics for this data.

Statistic	Female	Male
Mode	no mode	156
Median	154	155
Range	70	29

e) Using your stem and leaf plot and/or the table in d), compare the data for males and females.

i. List two ways are the two groups similar?

Same no. of students
Both grouped 140's - 170's

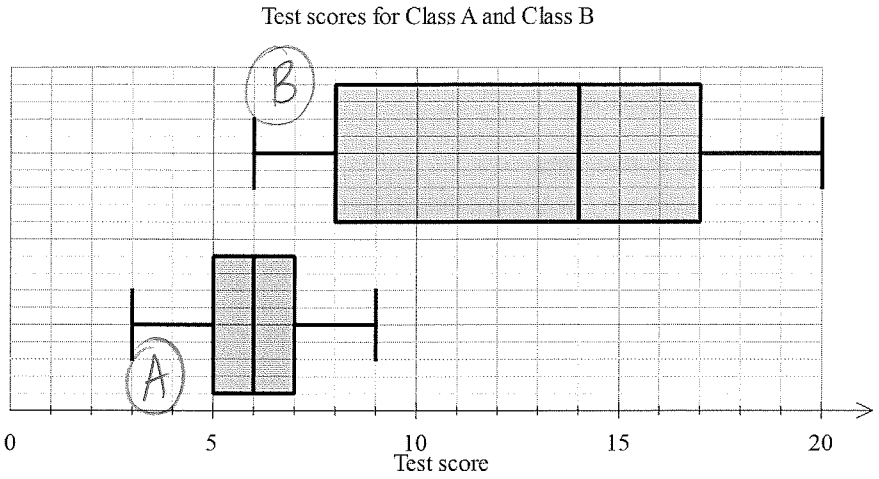
any reasonable statement.

ii. List two ways are the two groups different?

Outlier in Females
Range is very different

$\bar{x} = 153.75$ girls
$\bar{x} = 155.4$ boys

Question 5 [13 marks: 1, 5, 4, 3]



a) Eric is in Class A, he scored 5 on the test. **Label the two box plots** with their class names. ✓

b) Use the table below to enter the appropriate values for each of the plots.

Statistic	Class A	Class B
Minimum	3	6 ✓
First quartile	5	8 ✓
Median	6	14 ✓
Third quartile	7	17 ✓
Maximum	9	20 ✓

½ each

c) Calculate the range and interquartile range for each class, showing the working, in the table below.

Statistic	Class A	Class B
Range	6 ✓	14 ✓
Interquartile range	2 ✓	9 ✓

d) In each of the statements below, write A and B as appropriate to make the statement true.

- Class B has a much greater range than Class A ✓
- The minimum for Class B is the same as the median for Class A ✓
- For Class A, the data is symmetrical and for Class B ✓, 100% of the scores are greater than 6. (6 or greater)

END OF TEST