Student Name SOLUTIONS + MARKING GUIDE

Eastern Goldfields College

Mathematics Essentials 2018

Test 6 (U2 T3) – Calculator Free

Total Marks: 17 marks

Time allowed: 15 minutes

No calculator or notes permitted for this section.

Question 1 [3 Marks]

Complete the table by choosing the best **Data Display** and **Data Type** from the options provided. You can choose each option more than once.

Data Display

- Column graph
- Dot Plot
- Back to back stem and leaf diagram
- Histogram
- Box & whisker Plot

Data Type

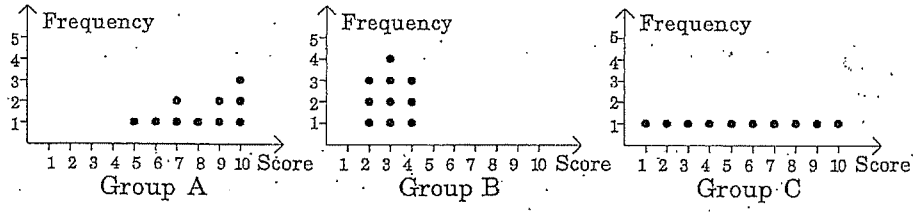
- Numerical
- Categorical

	Data Display	Data Type
The heights (measured to the nearest cm) of 20 boys and 20 girls to compare them.	BACK TO BACK STEM & LEAF	Numerical
The eye colour of all Year 11 students.	COLUMN GRAPH OR DOT PLOT	Categorical
The foot length of the members of your class	HISTOGRAM	Numerical
House prices in various suburbs	HISTOGRAM OR BOX & WHISKER	Numerical
The birth month of all Essentials students.	DOT PLOT OR COLUMN GRAPH	Categorical

√√ all correct
√√ 6–9 correct entries
√ at least 5 correct entries

Question 2 [4 marks – 1, 1, 1, 1]

Three groups of 10 students do a spelling test marked out of 10. The scores achieved by each group are shown in the dot frequency graphs below.



State which of the three groups have scores with

i) the greatest standard deviation C ✓

ii) the smallest standard deviation B ✓

iii) the greatest mean A ✓

iv) the smallest mean B ✓

Question 3 [2 mark]

Seven children attend an afterschool play centre. Their ages are listed below.

4, 5, 7, 8, 9, 9 and 11

If two new children, aged 6 years and 9 years, join the centre, which of the following statements is true?

A The mode will change

(B) The mean will change ✓✓ r/w

C The median will change

D The range will change

E None of the above

F All of the above

5

Question 4 [4 marks]

The number of break-and-enter offences in a rural city were recorded over a number of months.

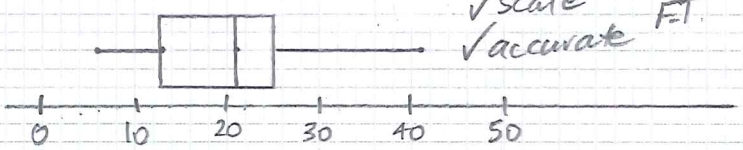
21, 25, 17, 28, 16, 21, 41, 22, 25, 20, 22, 11, 20, 12, 13, 12, 6, 12, 10, 19,
30, 22, 21, 14, 34, 33, 34

6, 10, 11, 12, 12, 12, 13, 14, 16, 17, 19, 20, 20, 21, 21, 21, 22, 22, 22, 23, 25, 30, 33, 34, 34, 41

Draw a boxplot for this data on the grid below.

Min = 6
Max = 41
Q1 = 13
Q3 = 25
Med = 21

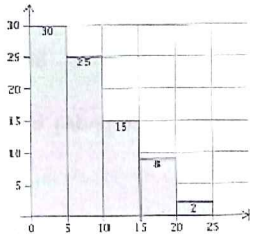
✓ quartiles
✓ max, min, median ✓



✓ scale
✓ accurate F.T.

Question 5 [3 marks – 1, 2]

a) Describe the distribution shown.



Skewed ✓

b) Give an example of what data could be represented in this graph and justify your answer.

✓ data

✓ justify

Time taken to get to school

30 people took between 0 and 5 mins
0–5 mins
5–10 mins etc.

Rainfall 0–5mm

End of Calculator Free Section

Student Name _____

Eastern Goldfields College

Mathematics Essentials 2018

Test 6 (U2 T3) – Calculator Assumed

Total Marks: 36 marks

Time allowed: 40 minutes

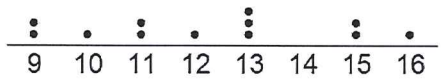
Calculator and notes are permitted for this section.

Show all working where appropriate to obtain full marks.

Question 6 [7 marks: 1, 1, 1, 2, 1, 1]

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

Number of births
per month in the Goldfields



a) What type of data is represented in this graph? Numerical data ✓

b) Calculate the range of the scores, ~~showing your working~~. 16 − 9 = 7 ✓

c) Determine the mode. 13 ✓

d) Determine the median. 12·5 ✓

e) Calculate the mean. 147 ÷ 12 = 12·25 ✓ ✓

f) Complete this sentence:
For the Goldfields region, you would expect approximately 13 ✓ births per month.

Question 7 [13 marks: 2, 2, 3, 4, 2]

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) Identify any outliers in the data.

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

106, ✓ 36 cm below next or much lower than next girl ✓

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

i. Mean

Decreases ✓

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	
77432	14	128899
7553322	15	004466689
5420	16	459
620	17	00

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 ✓
Mean	153.75	155.4 ✓

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

The range for males is much lower due to no outliers. Females don't have a mode, whereas males do. ✓✓ Mean is higher for males

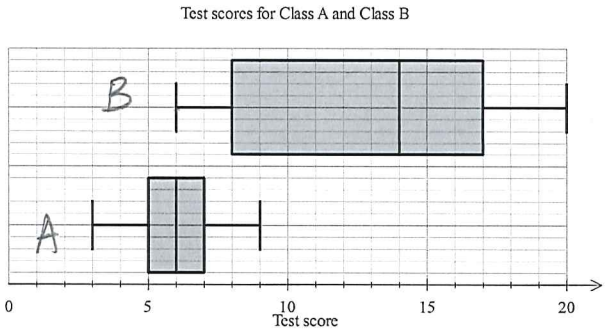
etc any 2 correct comparisons

f) Which average is best and and justify your choice.

Median ✓ as more representative of most height 106cm female is impacting the mean for girls. ✓

Question 8 [10 marks: 1, 5, 2, ~~4~~ 3]

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



✓ r/w

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 ✓ ½ each

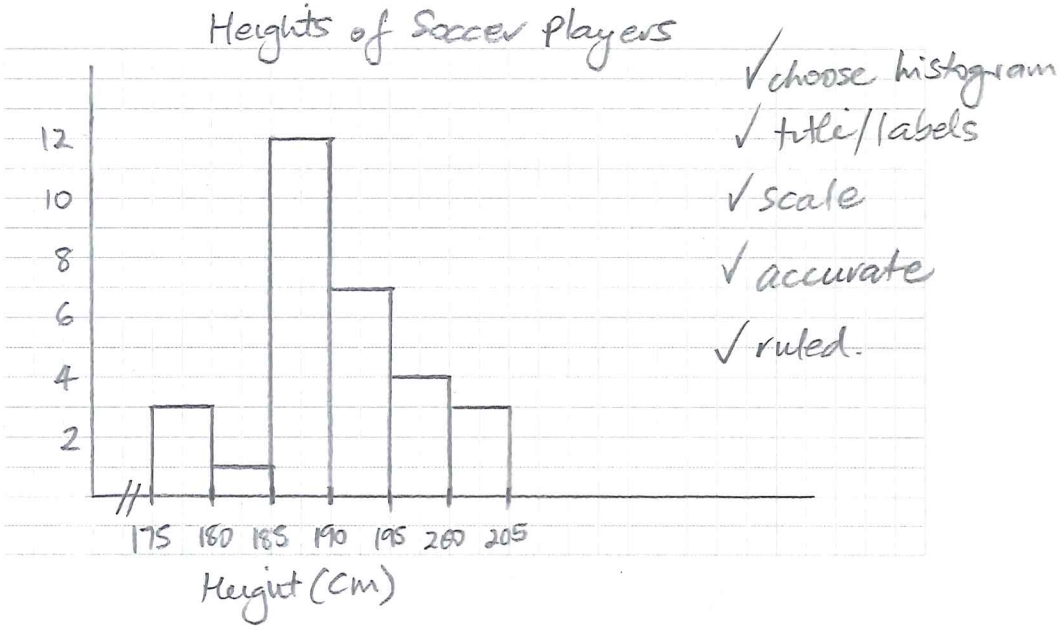
d) In each of the statements below, write A and B as appropriate to make the statement true.

- 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
- The standard dev. of class A is much lower ✓ than the σ of class B ✓

Question 9 [6 marks]

The frequency table for the heights of a group of soccer players is given below.
Graph this information below.

Height	Frequency
175 up to 180	3
180 up to 185	1
185 up to 190	12
190 up to 195	7
195 up to 200	4
200 up to 205	3



✓ choose histogram
✓ title/labels
✓ scale
✓ accurate
✓ ruled.

End of Test