Mathematics Essential

Test 9, 2015   Answers .

Topics – Statistics

47

=_____ %

Total Time:	*45* minutes
Total Reading:	*5* minutes
Total Working:	*25* minutes
Weighting:	*4 of the year.*
Equipment Allowed:	*Calculator*

You must include all working out to receive full marks

CALCULATOR ASSUMED

1. **(6 marks:1, 1, 1, 1, 1, 1.)**
   Using the following words complete the sentences below:

Mean   Median   Mode   Range   Outlier   Quartile   Percentile   Standard Deviation

a. Standard Deviation is a measure of spread that describes how far scores are from the mean.

b. The mode is the most common or frequent score.

c. An outlier is a score that is very different from the rest of the data. It can be either much bigger or much smaller than the other scores.

d. The median is the middle score when the scores are placed in order from smallest to largest.

e. The range describes the spread of data.

f. The mean is calculated by adding all the scores and diving by the number of scores. It is what most people call the 'average'.

2. **(5 marks, 5 marks)**
Calculate the mean, median, mode and range of the following:

a) Height in cm; 162, 165, 150, 148, 188, 183, 166, 164, 172.

Mean _____ 166·44 ✓✓

Median __ 165 _____ ✓

148 150 162 164 165 166 172 183 188

Mode_____ no mode ✓

Range_____ 188 - 148 = 40 ✓

b) Cars per household; ~~1, 1, 2,~~ 3, 5, ~~0, 0, 2, 2, 1, 2~~ 0 0 1 1 1 2 2 2 2 3 5

Mean_____ $\frac{19}{11}$ ✓ = 1·73 ✓

Median_____ 2 ✓

Mode_____ 2 ✓

Range_____ 5 - 0 = 5 ✓

3. (8 marks: 1, 1, 1, 1, 1, ; 3)

The following stem and leaf plot shows the price of petrol (in cents per litre) at a random selection of metropolitan petrol stations on a Friday.
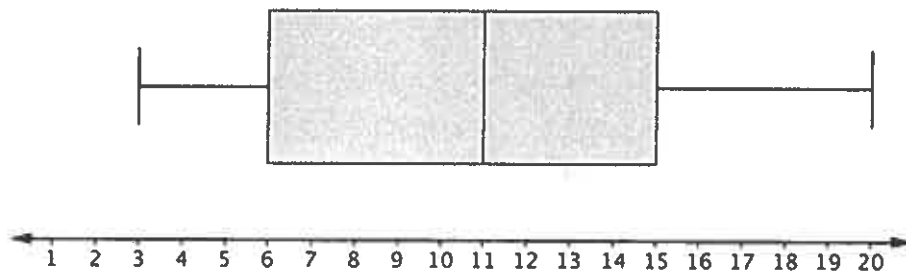
```
14 | 3 9 9
15 | 1 2 2 3 5
16 | 5 5 5 9 9
17 | 2 3 5
```

a. How many petrol stations were in the sample? 16 ✓

b. What is the highest price for petrol?

175ᶜ $1·75 ✓

c. What is the spread of the prices for petrol? 175 - 143 = 32 ✓

d. What is the median price of petrol? 5 ✓

e. Is there a mode? If so, what is the mode price of petrol?

165 ← $1·65 ✓

f. Calculate the mean price of petrol?

$\frac{2557 ✓}{16 ✓}$ = 159·81 ✓

4. **(10marks: 6,4)**

The following boxplot shows test results for a class:

State whether the following questions are true or false:

a. The range of the data is 15 _____ False ✓
b. The interquartile range is 9 _____ True ✓
c. About 50% of the scores lie between 6 and 15 _____ True ✓
d. Fifty percent of the scores are less than 10 _____ False ✓
e. About seventy five percent of the scores are greater than 11 _____ False ✓
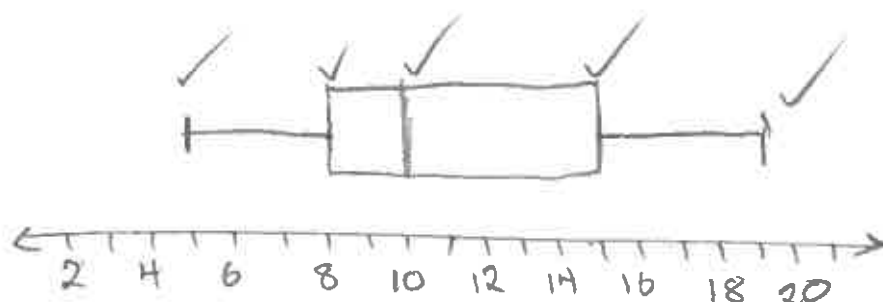f. About twenty five percent of the scores are greater than 15 _____ True ✓

There were 30 students who sat the test.

a. What was the highest mark? _____ 20 ✓
b. What was the lowest mark? _____ 3 ✓
c. Approximately how many students score less than 11 out of 20? _____ 50% ✓
d. Estimate the number of students who scored 13 out of 20. _____ ≈ 37% ✓

5. (5 marks)

Using the following information construct a boxplot

Lowest score = 5, highest score = 19, median = 10, Q_1=8, Q_3=15

6. (5 marks, 5 marks)

Draw a box and whisker plot for the following data set:
5, 1, 7, 8, 3, 6, 3, 6, 8, 4

1 3, 3. 4. ⑤ 6 7, 8 8

min 1 ✓ max 8 ✓
median 5 ✓
$Q_1 = 3$ ✓
$Q_3 = 7.5$ ✓