High School
Mathematics Test 2013

Year 9

Basic Statistics

Calculator Allowed

Skills and Knowledge Assessed:

- Construct and compare a range of data displays including stem-and-leaf plots and dot plots (ACMSP170)
- Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data (ACMSP171)
- Describe and interpret data displays using median, mean and range (ACMSP172)
- Investigate techniques for collecting data, including census, sampling and observation (ACMSP284)
- Investigate the effect of individual data values , including outliers, on the mean and median

Name_____

Section 1 Short Answer Section

Write all working and answers in the spaces provided on this test paper.

1. Nine workers record the number of hours that they work in a week. They were:

   36, 44, 32, 38, 41, 44, 37, 45 and 43.

   Find the mean number of hours worked.

   …….

   …….

2. The ages of 12 members of a family at a party are recorded below.

   12, 15, 32, 25, 55, 72, 44, 7, 9, 23, 25 and 58.

   What is the median age?

   …….

   …….

3. The amounts of money raised by ten stalls at the school fete are listed below.

   $140, $165, $35, $125, $34, $75, $125, $68, $75, $140, $35, $125 and $55.

   What is the mode of the amounts?

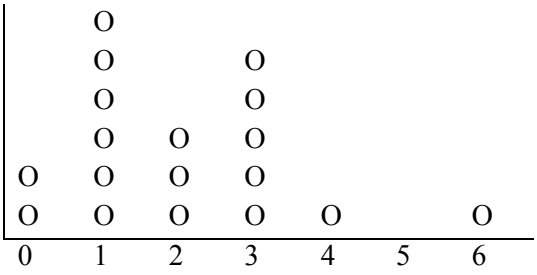
   …….

4. What is the range of the scores below on 9 holes by 13 golfers?

   27, 32, 35, 28, 36, 42, 32, 28, 25, 22, 38, 25 and 33.

   …….

Questions 5 and 6 refer to the dot plot which shows the number of children in 18 households.



5. What is the median number of children?

……

……

6. What is the mean number of children?

……

……

Questions 7 and 8 refer to the stem and leaf plot which shows the scores in 25 shots at a dartboard.

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

7. What is the median of the scores?

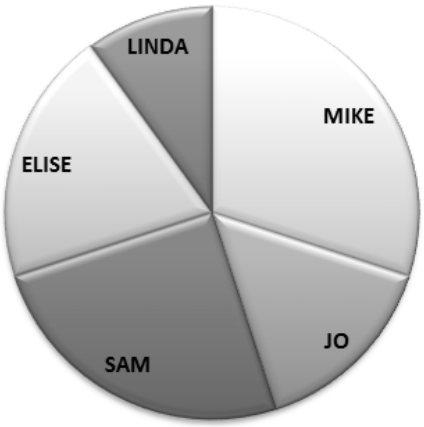
……

……

8. What is the modal score?

……

Questions 9 and 10 refer to the sector graph below which shows how five friends divided a lottery win of $400. (A protractor will be useful).



9. Which friend received a 30% share of the win?

……

……

10. How much did Linda receive?

……

……

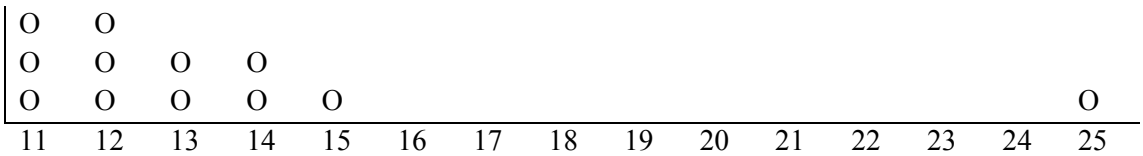
11. Darlene wants to know what proportion of people would support a petition that she wants to distribute at school. Describe how she could select a random sample of students to gauge their support.

……

……

……

12. The dot plot below shows the ages of 12 people. The median of the scores is 12.5 and the mean is approximately 13.6.



What name is given to the score of 25, and what effect does it have on the median, mean and range?

……

……

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Section 2 Multiple Choice Section

Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section.

1. The mean height of four trees in the Smiths garden is 4.2 metres. The first three trees have heights of 3.2 metres, 5.6 metres and 4.4 metres. What is the height of the fourth tree?

   A. 3.6 metres B. 4.2 metres C. 4.4 metres D. 13.2 metres

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2. Martin runs a café. He counts the number of customers each day for seven days and arranges the numbers for each day in order from the busiest day to the least busy. Tuesday's numbers fell in the middle of this list. Which term describes what he was finding?

   A. The mean B. The median C. The mode D. The range

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3. Leo wants to print images on T-shirts to sell at the weekend markets. He asks a sample of 40 people their shirt size. Which two measures would be most useful to him in planning the number of shirts he should print?

   A. The mean and median. B. The mean and mode.
   C. The range and mean. D. The range and mode.

---

4. The mean age of the three Harris children is 12 and the mean age of the four Richards children is 5. What is the mean age of the seven children altogether?

   A. 5 B. 7 C. 8 D. 10

---

5. Five students compare their scores on a game. The range was 50 and the mode was 120. Which of the following could be the scores?

   A. 100, 120, 140, 140, 150 B. 100, 120, 120, 140, 150

   C. 100, 100,120, 140, 150 D. 100, 120, 120, 130, 140

---

6. A class of 20 students analysed their results on a test out of 25 and found the mean, median and mode were all 18 and the range was 12. A student who scored 18 left the class. Which of the scores could change?

   A. The mean. B. The median. C. The mode. D. The range.

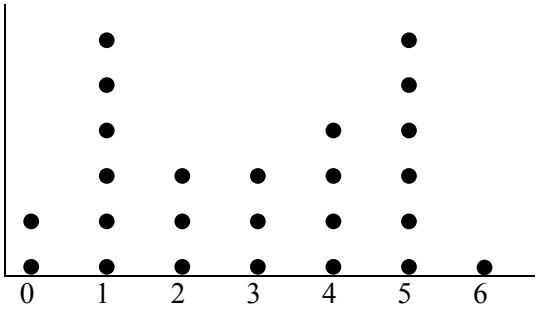
---

7. What is the median of the set of scores below?

Score	Frequency
2	2
3	4
4	6
5	7
6	5

A. 3.5 B. 4 C. 4.5 D. 5

8. What is the mode of the data shown on the dot plot?



A. 1 B. 1 and 5 C. 3 D. 5

Questions 9 and 10 refer to the stem and leaf plot of the hours worked in a week by the drivers who work for a taxi company.

1	4 6
2	3 4
3	2 5 5
4	2 3 8 8
5	1 3 4
6	0

9. What was the mean number of hours (correct to 1 decimal place)?

A. 3.9 B. 35.0 C. 37.2 D. 38.5

10. What was the range of the hours?

A. 46 B. 48 C. 51 D. 60

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Section 3 Longer Answer Section

Write all working and answers in the spaces provided on this test paper.

Marks

1. a) Complete the frequency distribution table below. **3**

Score (x)	Frequency (f)	fx	Cumulative Frequemcy
1	2		
2	5		
3	8		
4	4		
5	5		
6	6		

$\Sigma f =$ $\Sigma fx =$

b) Calculate the mean of the scores.(Answer correct to the nearest tenth.) **1**

……

……

c) Which is greater, the median or the mode, and by how much? **2**

……

……

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Multiple Choice Answer Sheet

Name _____

Completely fill the response oval representing the most correct answer.

1.	A ⬭	B ⬭	C ⬭	D ⬭
2.	A ⬭	B ⬭	C ⬭	D ⬭
3.	A ⬭	B ⬭	C ⬭	D ⬭
4.	A ⬭	B ⬭	C ⬭	D ⬭
5.	A ⬭	B ⬭	C ⬭	D ⬭
6.	A ⬭	B ⬭	C ⬭	D ⬭
7.	A ⬭	B ⬭	C ⬭	D ⬭
8.	A ⬭	B ⬭	C ⬭	D ⬭
9.	A ⬭	B ⬭	C ⬭	D ⬭
10.	A ⬭	B ⬭	C ⬭	D ⬭

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ANSWERS

Section 1	
1.	Mean $= \frac{360}{9} =$ 40hours.
2.	Ages in order are ~~7, 9, 12, 15, 23~~, 25, 25, ~~32, 44, 55, 58, 72~~ Median is 25.
3.	Mode is \$125, (occurs 3 times).
4.	Range $= 42 - 22 = 20$
5.	Median is the average of the 9th and 10th scores which is 2.
6.	Sum of scores = $0 \times 2 + 1 \times 6 + 2 \times 3 + 3 \times 5 + 4 + 6 = 6 + 6 + 15 + 4 + 6 = 29$ Mean $= \frac{37}{18} = 2\frac{1}{18}$ children
7.	Median is the 13th score which is 32.
8.	Mode is 26 (occurs 3 times.)
9.	$30\% = \frac{3}{10}$ $\frac{3}{10} \times 360 = 108^\circ$ Mike has an angle of 108°.
10.	Linda's angle is 36°. $\frac{36}{360} = \frac{1}{10}$ $\frac{1}{10}$ of \$400 = \$40
11.	Any method that involves obtaining a smaller number of students including both sexes and all years at the school.
12.	The score is called an **outlier** and it increases the mean, relative to the median and makes the range very large (14 compared to 4 if the outlier was not included).

Section 2	
1.	A
2.	B
3.	D
4.	C
5.	B
6.	C
7.	C
8.	B
9.	D
10.	A

Section 3

1. (a)

Score (x)	Frequency (f)	fx	Cumulative Frequemcy
1	2	2	2
2	5	10	7
3	8	24	15
4	4	16	19
5	5	25	24
6	6	36	30
	$\Sigma f =$ 30	$\Sigma fx =$ 113	

3 marks, 1 for each column, and 1 for totals.

b) Mean = $\frac{113}{30} = 3.8$ **1 mark**

c) Median = 3.5, mode = 3. **2 marks**
The median is greater by 0.5

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Multiple Choice Answer Sheet

Name Marking Sheet

Completely fill the response oval representing the most correct answer.

1.	A ●	B ○	C ○	D ○
2.	A ○	B ●	C ○	D ○
3.	A ○	B ○	C ○	D ●
4.	A ○	B ○	C ●	D ○
5.	A ○	B ●	C ○	D ○
6.	A ○	B ○	C ●	D ○
7.	A ○	B ○	C ●	D ○
8.	A ○	B ●	C ○	D ○
9.	A ○	B ○	C ○	D ●
10.	A ●	B ○	C ○	D ○