High School Mathematics Test 2013

Year 7

Data Collection and Representation

Non Calculator Section

Skills and Knowledge Assessed:

- Investigate techniques for collecting data, including census, sampling and observation (ACMSP284)
- Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes (ACMSP206)
- Identify and investigate issues involving numerical data collected from primary and secondary sources (ACMSP169)
- Construct and compare a range of data displays including stem- and - leaf plots and dot plots (ACMSP170)

Name_____

Answer all questions in the spaces provided on this test paper by:

Writing the answer in the box provided.

or

Shading in the bubble for the correct answer from the four choices provided.

Show any working out on the test paper.

1. Amy does a survey of the number of texts sent last night by students in her class.
This is an example of:

   ☐ Continuous Numerical Data. ☐ Discrete Numerical Data.

   ☐ Continuous Categorical Data. ☐ Discrete Categorical Data.

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2. Amy asks every member of the class to write down the information she needs for her survey on a piece of paper.
She has used:

   ☐ A census of the class. ☐ A random sample of the class.

   ☐ A census of the school. ☐ A random sample of the school.

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3. Which of the following is an example of obtaining an unbiased random sample from a school of 600 students?

   ☐ Choosing every tenth male in the even numbered grades.

   ☐ Choosing every tenth student in year 9.

   ☐ Choosing every tenth male student in years 7 and female student in year 9.

   ☐ Choosing every tenth male and every tenth female from each grade.

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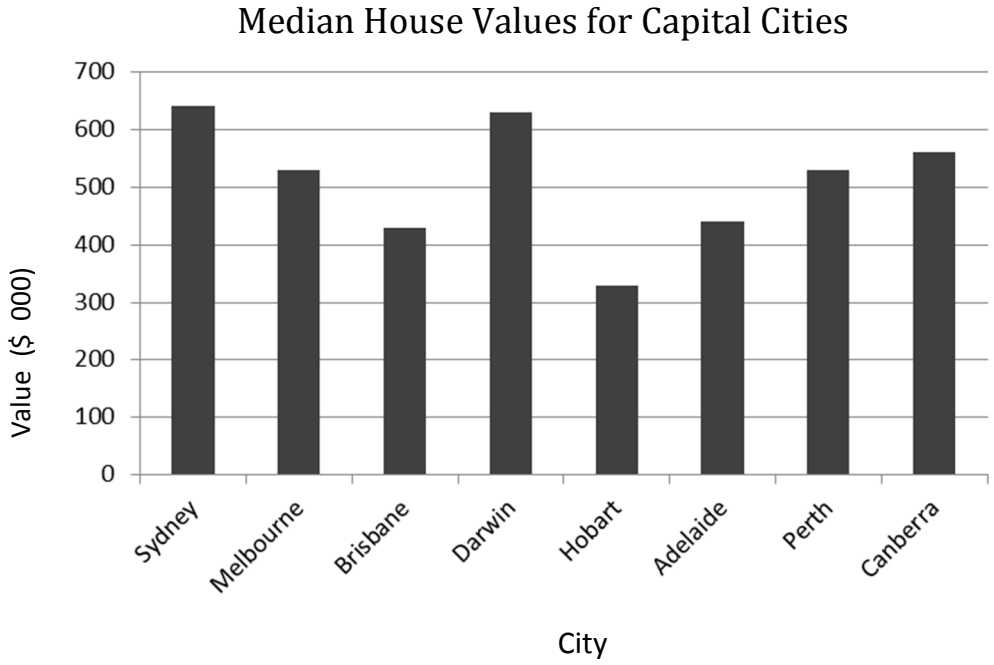
4. Keira asks a group of people their preferred method of travel to work. Their answers included car travel, bus, train, bicycle etc.
Which type of graph would be unsuitable to represent this data?

   ☐ Column Graph. ☐ Divided bar Graph.

   ☐ Line Graph. ☐ Sector Graph.

Questions 5 – 8 refer to the column graph below which shows the median house values in Australian capital cities in 2012.



5. Estimate the median house value for Adelaide.

6. Which city had the third highest median property value?

☐ Canberra ☐ Darwin ☐ Melbourne ☐ Perth

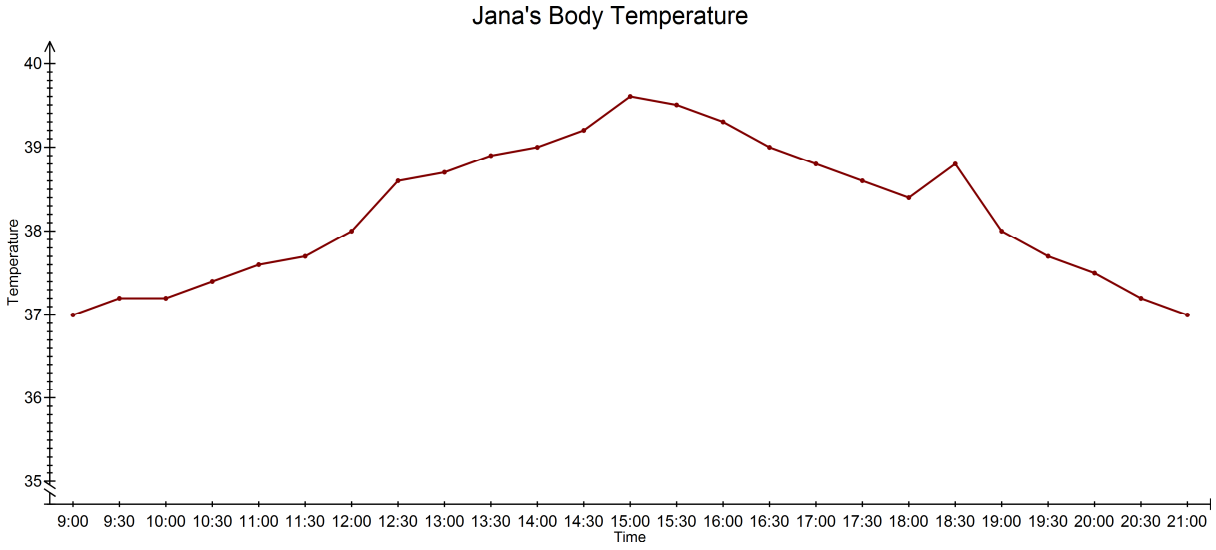
7. Which two cities had a value of $530 000?

and

8. From the information in the graph, which city could best use the slogan :
"Australia's most affordable city"

☐ Adelaide ☐ Brisbane ☐ Hobart ☐ Sydney

Questions 9 – 12 refer to the line graph which shows the temperature of an athlete during a period when she was admitted to hospital. **(A ruler would be helpful)**



9. What was her maximum temperature?

10. At what time did her temperature rise again briefly before continuing to fall?

11. A temperature is considered a fever, when it exceeds 37.7°C. Between what times did she have a fever?

- ☐ 10:00 and 19:30
- ☐ 11:30 and 18:00
- ☐ 11:30 and 19:30
- ☐ 12:30 and 20:30

12. How long was her temperature above 39.0 °C?

- ☐ $1\frac{1}{2}$ hours
- ☐ 2 hours
- ☐ $2\frac{1}{2}$ hours
- ☐ 3 hours

The frequency histogram below shows the number of goals that Lukas scored in each game in all the AFL games he has played.

13. Use the histogram to complete the rest of the frequency table below. **(2marks)**

Number of Children in Family

Score	Tally	Frequency(*f*)
2	𝍸 |	6
3	𝍸 ||	
4		
5		
6		
7		

14. Draw a frequency polygon on the graph above.

15. How many AFL games had Lukas played?

16. How many times did he score 6 goals in a game?

17. He scored the same number of goals in 6 of his games.
What number of goals was this?

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Calculator Allowed Short Answer Section

Name_____

Answer all questions in the spaces provided on this test paper by:
Writing the answer in the box provided.
or
Shading in the bubble for the correct answer from the four choices provided.
Show any working out on the test paper. Calculators are allowed.

1. A magazine wants feedback from its subscribers on its articles.
Which of these surveys uses a biased sample?

- ☐ The magazine rings every 20th subscriber on an alphabetical list.
- ☐ The magazine posts a questionnaire to every 10th subscriber on an alphabetical list.
- ☐ A magazine rings all subscribers who have made a complaint about its articles.
- ☐ A magazine rings all subscribers who have a vowel as the first letter of their name.

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2. Phillip draws a sector graph showing the country of birth of his classmates.
This is an example of:

- ☐ Continuous Numerical Data.
- ☐ Discrete Numerical Data.
- ☐ Categorical Data.
- ☐ Quantitative Data.

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3. Which of the following is an example of using observation as a data collection method?

- ☐ The newspaper rings every 20th voter on the electoral roll.
- ☐ A scientist records the number and type of birds that pass a spot in the forest.
- ☐ A company asks all of its shareholders to vote for the board members.
- ☐ A reporter asks people outside a train station for their opinions.

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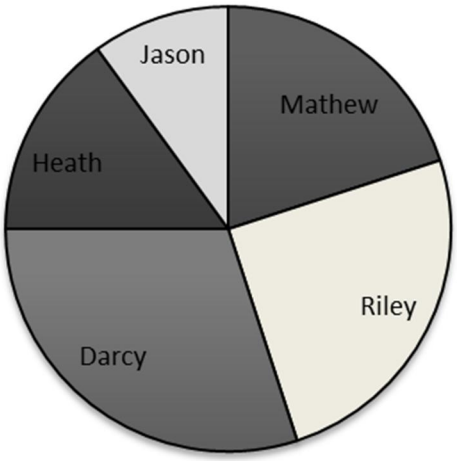
4. Mason recorded the temperature in his classroom each hour for a full school day.
Which type of graph would be most suitable to represent this data?

- ☐ Column Graph.
- ☐ Divided bar Graph.
- ☐ Line Graph.
- ☐ Sector Graph.

Questions 5 – 9 refer to the she sector graph which shows the proportion that five friends invested in a company. **(You will need a protractor)**

Investors in Builtech Limited



5. Which friend invested a quarter of the company's value?

☐ Darcy ☐ Heath ☐ Mathew ☐ Riley

6. Who were the two largest investors in the company?

_____ and _____

7. What fraction of the investment was made by Mathew?

$\frac{\square}{\square}$

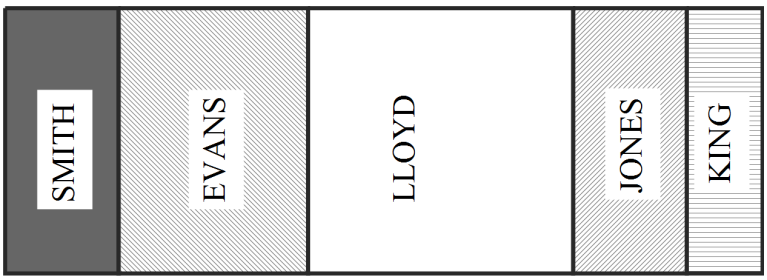
8. $36 000 was invested by the friends in total.
How much was invested by Jason?

_____

9. What percentage of the total investment was made by Heath?

_____

Questions 10 to 14 refer to the divided bar graph which shows the surnames of those at a family reunion. **(A ruler would be helpful.)**



ATTENDANCE AT A FAMILY REUNION

10. Which surname made up 35% of those at the reunion?

☐ Evans ☐ Jones ☐ Lloyd ☐ Smith

11. Which two surnames had the same numbers at the reunion ?

☐ and ☐

12. What fraction of those at the reunion had the surname Jones?

☐/☐

13. What percentage of those at the reunion had the surname Evans?

☐

14. There were 160 people at the reunion.
How many had the surname Lloyd?

☐

Questions 15 – 18 refer to the stem and leaf plot below, which was drawn when a sample of people were asked their height in centimetres.

Stem	Leaf
13	7 7 9
14	2 4 7 8
15	2 3 3 4 7 8
16	0 2 3 4 5 5 7
17	0 3 4 4 4 8
18	2 4 5 8

15. How many people had a height of 165 cm?

16. What height was most common?

17. What was the greatest height recorded?

18. What is the difference between the greatest and least heights?

5 cm ☐ 51 cm ☐ 55 cm ☐ 151 cm ☐

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ANSWERS

Non Calculator Section

1.	Discrete Numerical Data.
2.	A census of the class
3.	Choosing every tenth male and every tenth female from each grade.
4.	Line Graph.
5.	Approx $440 000
6.	Canberra
7.	Melbourne and Perth
8.	Hobart
9.	39.6°C
10.	18:00
11.	11:30 and 19:30
12.	$2\frac{1}{2}$ hours
13.	**2 marks** Number of Children in Family

Score	Tally	Frequency(f)
2	𝍸 I	6
3	𝍸 II	7
4	𝍸 IIII	9
5	𝍸 𝍸 II	12
6	𝍸 IIII	9
7	𝍸 II	7

14.	
15.	50 games
16.	9 times
17.	2 goals

Calculator Allowed Section

1.	A magazine rings all subscribers who have made a complaint about its articles
2.	Categorical Data
3.	A scientist records the number and type of birds that pass a spot in the forest.
4.	Line Graph.
5.	Riley
6.	Darcy and Riley
7.	$\frac{1}{5}$
8.	$3 600

9.	15%
10.	Lloyd
11.	Jones and Smith
12.	$\frac{3}{20}$
13.	25%
14.	$\frac{35}{100} \times 160 = \frac{7}{20} \times 160 = 56$
15.	2 people
16.	174 cm
17.	188 cm
18.	51 cm