Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
14 – 15	
16 – 17	
18 – 19	
20 – 21	
TOTAL	

AQA

General Certificate of Secondary Education
Foundation Tier
June 2014

Statistics

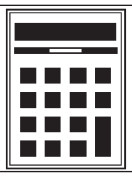
Unit 1 Written Paper

43101F

F

Monday 23 June 2014 1.30 pm to 3.00 pm

For this paper you must have:
- a calculator
- mathematical instruments.



Time allowed
- 1 hour 30 minutes

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the space provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work that you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.
- You are expected to use a calculator where appropriate.

Advice
- In all calculations, show clearly how you work out your answer.

You may need to use the following formulae:

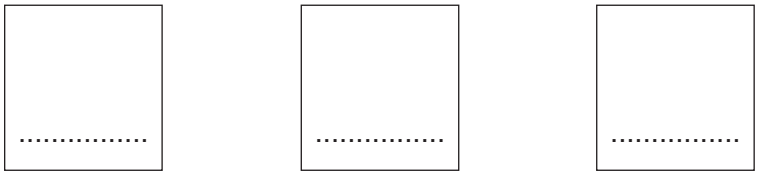
Mean of a frequency distribution $= \dfrac{\sum fx}{\sum f}$

Mean of a grouped frequency distribution $= \dfrac{\sum fx}{\sum f}$,

where x is the mid-interval value.

Answer **all** questions in the spaces provided.

1 (a) Andrew has three number cards.



The **mode** of Andrew's numbers is 10.
Write a number on each card to show what they could be.

[1 mark]

1 (b) Here are some numbers.

6 9 7 8 6

Sarah says, "The mode is double the range."

Is Sarah correct?
Tick a box.

☐ Yes ☐ No

Show your working.

[3 marks]

.....

.....

.....

.....

.....

.....

4

Turn over ▶

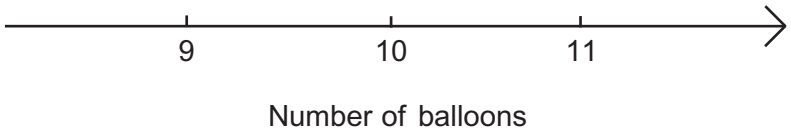
2 (a) Packs of balloons are labelled with the claim, 'Contains at least 10 balloons'.

Jo opens eight packs and counts the number of balloons in each pack.
Her results are

10 11 10 11 10 10 11 9

Show the results on a dot plot.
The base line has been drawn for you.

[2 marks]



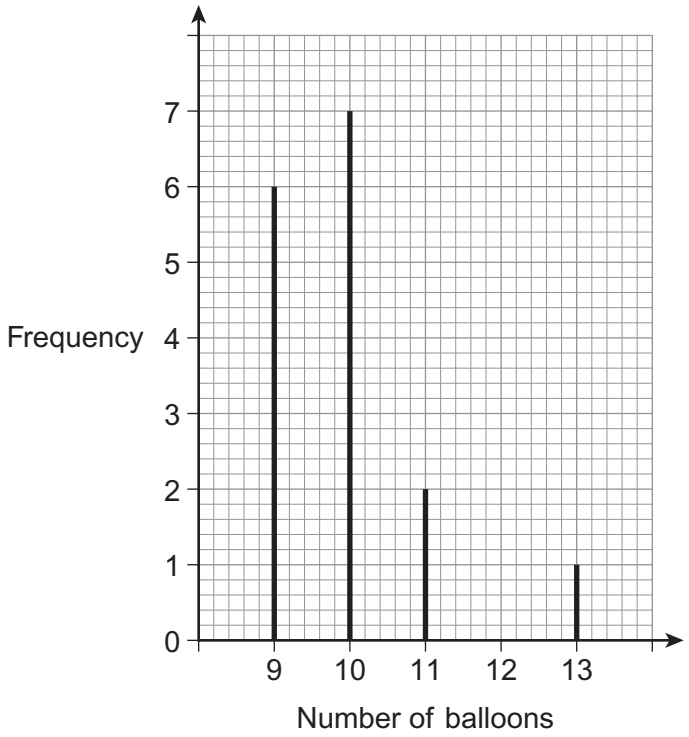
2 (b) Give **one** reason Jo might think the claim 'Contains at least 10 balloons' is fair.

[1 mark]

.....

.....

2 (c) Kim opens another 16 of these packs of balloons.
She draws this vertical line graph to show the number of balloons in each pack.



2 (c) (i) What fraction of Kim's packs contain exactly 9 balloons?
Give your answer in its simplest form.

[2 marks]

.....

.....

Answer .....

2 (c) (ii) Do you now think the claim 'Contains at least 10 balloons' is fair?
Give a reason for your answer.

[1 mark]

.....

.....

6

Turn over ▶

3 (a) Circle the **three** values which could be probabilities.

[2 marks]

1.3 0.4 0 –0.5 1

3 (b) A fair coin is thrown.

Write down the probability it lands on heads.

[1 mark]

Answer .....

3 (c) A weather forecaster says,

"There is a 90% chance it will rain today."

What is the chance it will **not** rain today?

[1 mark]

Answer .....

4 (a) In a game you have to knock down skittles.
Dan plays the game 8 times.
The number of skittles he knocks down each time is

10 6 8 8 7 4 5 8

Work out the mean number of skittles he knocks down.

[3 marks]

.....

.....

Answer .....

4 (b) Erin also plays the game 8 times.
The mean number of skittles she knocks down is 7.5

How many skittles does Erin knock down altogether?

[2 marks]

.....

.....

Answer .....

4 (c) Look at the information in parts (a) and (b).

Who do you think is the better player?
Give a reason for your answer.

[1 mark]

.....

.....

4 (d) Name **one** other measure you might use to compare the players' results.

[1 mark]

Answer .....

11

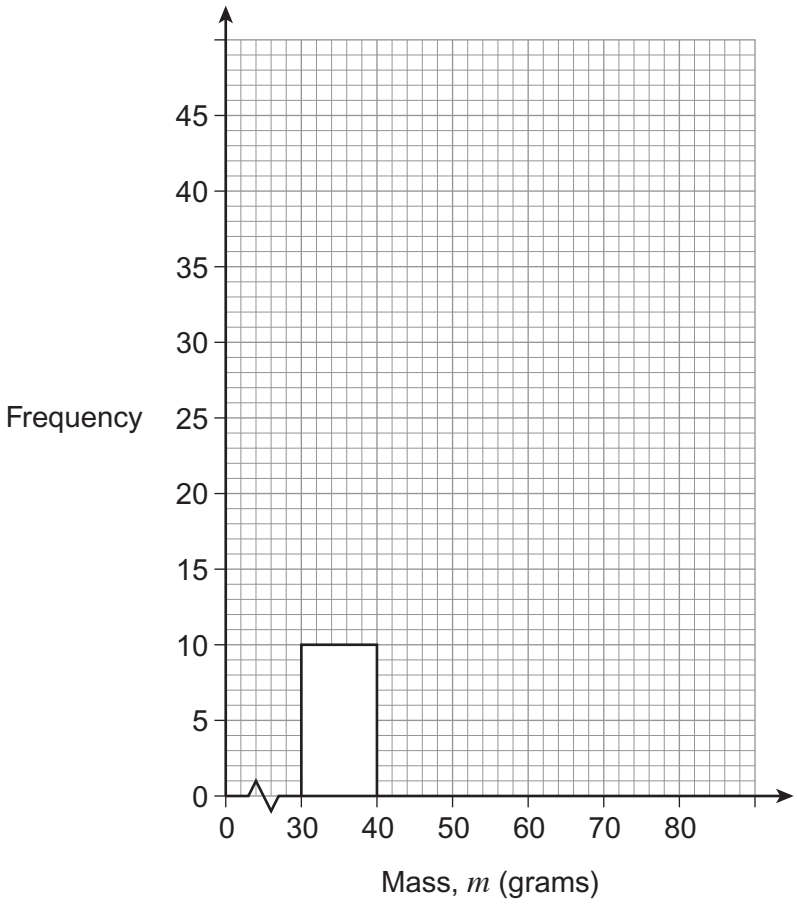
Turn over ▶

5 The table shows the mass of 100 hamsters.

Mass, m (grams)	Frequency
$30 \leqslant m < 40$	10
$40 \leqslant m < 50$	35
$50 \leqslant m < 60$	42
$60 \leqslant m < 70$	10
$70 \leqslant m < 80$	3

5 (a) Complete the frequency diagram.

[3 marks]



5 (b) The modal group for the mass of the hamsters is between 50 and 60 grams.

5 (b) (i) How can you tell this by looking at the table?

[1 mark]

.....

.....

5 (b) (ii) How can you tell this by looking at the graph?

[1 mark]

.....

.....

5 (c) What is the probability that one of these hamsters, chosen at random, has a mass of 60g or more?

[2 marks]

.....

.....

Answer .....

Turn over for the next question

7

6 Six lifeguards work at a swimming pool.
The table shows the number at the swimming pool each day for three weeks.

Number of lifeguards	Frequency
1	0
2	5
3	4
4	5
5	6
6	1
	Total = 21

6 (a) How many days per week is the swimming pool open?

[1 mark]

Answer .....

6 (b) Work out the median number of lifeguards working.
You **must** show your working.

[2 marks]

.....

.....

Answer .....

6 (c) The manager claims that, on average, more than half the lifeguards work on a given day.

Does your answer to (b) support this?
You **must** explain why.

[2 marks]

.....

.....

.....

7 The head teacher of a school thinks there may be a connection between pupil behaviour and how windy the weather is.
She plans to collect some data to test if she is correct.

7 (a) State a possible hypothesis she could use.

[1 mark]

.....

.....

7 (b) Name a suitable data collection method for collecting data on how well pupils behave.

[1 mark]

Answer .....

7 (c) Name a **different** variable which might affect pupil behaviour.

[1 mark]

Answer .....

Turn over for the next question

8

8 There are 38 houses on a street numbered 1 – 38.

8 (a) Use these random numbers to obtain a random sample of **five** houses from 1 – 38.

[3 marks]

25 16 44 87 25 09 40 11 12

Random sample

8 (b) The council is considering making the street one-way.
They want to know the householders' views on this.

Write a suitable question **with response boxes** that they may use.

[2 marks]

Question .....

.....

Response Section

9 (a) In 2014 the price of a tablet was lower than in 2013.

Taking 2013 as the base year, which of these statements is true about the index number for 2014?
Circle the correct answer.

[1 mark]

It is less than 100 | It is exactly 100 | It is more than 100

9 (b) In 2013 a laptop cost £500.
Using 2013 as base year, the index number for the cost of a laptop in 2014 was 110.

How much did it cost in 2014?

[2 marks]

.....

.....

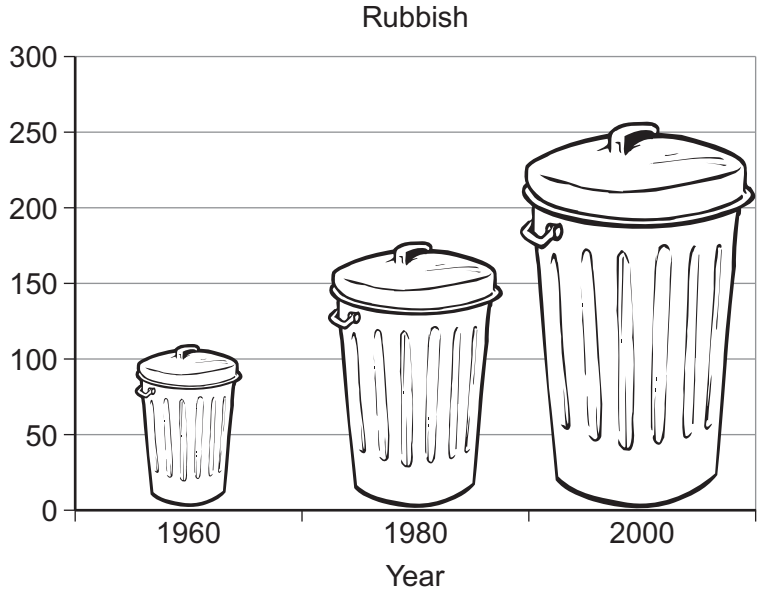
.....

Answer £ .....

Turn over for the next question

8

10 The graph was used to show how much more rubbish has been produced since 1960.



Give **two** different criticisms of the graph.

[2 marks]

Criticism 1 .....

.....

Criticism 2 .....

.....

11 John collects stamps from all over the world.

Decide whether each of the following variables is discrete, continuous or qualitative. In each case, circle the correct word.

11 (a) The length of a stamp.

[1 mark]

Discrete Continuous Qualitative

11 (b) The number of stamps in his collection.

[1 mark]

Discrete Continuous Qualitative

11 (c) The country the stamp is from.

[1 mark]

Discrete Continuous Qualitative

Turn over for the next question

5

12 Heidi is planning to hold a charity collection at a local restaurant.
She will do this on either a Saturday evening or a Sunday evening.

To help her decide which evening to choose she finds out the number of people who visited the restaurant on these days.

Here are her results for the last 15 **Saturdays**.

113	101	87	94	126	128	111	96
89	102	106	89	105	119	88	

12 (a) Show the data in an ordered stem-and-leaf diagram.

[3 marks]

Key ..... | ..... represents ..... people

8	.....
9	.....
10	.....
11	.....
12	.....

12 (b) Work out the median for the data.

[2 marks]

.....

.....

Median = ... people

12 (c) Show that the interquartile range for the data is 24 people.

[3 marks]

.....

.....

.....

.....

.....

.....

12 (d) Data for the number of people visiting the restaurant over the last 15 **Sundays** is summarised below.

Median = 110 **Interquartile range = 17**

Give **two** reasons why Heidi should hold the collection on a Sunday rather than a Saturday.

[2 marks]

Reason 1 .....

.....

Reason 2 .....

.....

Turn over for the next question

10

13 A teaching agency employs 400 tutors.
Each tutor teaches one of three subjects: English, Maths or Science.
The number of tutors of each subject is shown in the table.

Subject	Number of tutors
English	200
Maths	185
Science	15

The manager wishes to survey a sample of tutors.
She decides to sample 50 of the 400 tutors.

13 (a) The manager suggests selecting the first 50 tutors from an alphabetical list of the 400.

Name this method of sampling.

[1 mark]

Answer .....

13 (b) The assistant manager suggests selecting a sample of 50, stratified by subject.
How many Maths tutors would there be in this sample?

[3 marks]

.....

.....

.....

Answer .....

13 (c) The survey will be carried out online.

Give **one** advantage and **one** disadvantage of using this method of data collection.

[2 marks]

Advantage .....

.....

Disadvantage .....

.....

14 (a) Kiran has three different breeds of cow.

He has 280 cows altogether.
One-quarter of his cows are Angus breed, 125 are Hereford and the rest are Ayrshire.

Kiran needs to test all his cows for a disease but has so far only been able to test 40% of each breed.

Complete the table to show this information.

[5 marks]

	Angus	**Hereford**	**Ayrshire**	**Total**
Tested				
Not tested				
Total		**125**		**280**

14 (b) One of the cows is selected at random.

Work out the probability that the cow chosen is

14 (b) (i) a 'Hereford' and 'not tested'

[1 mark]

.....

Answer .....

14 (b) (ii) **not** an 'Ayrshire'.

[2 marks]

.....

.....

.....

Answer .....

14

15 The table is a summary of key statistics relating to Housing, Traffic, Recycling and Crime in the UK in 2009.

	Number of houses built (thousands)	Median house price (£ thousands)	Percentage increase in traffic between 1999 and 2009	Percentage of household waste recycled	Number of recorded crimes per 100,000 population
English Regions					
North East	3.9	120	9.1	34.7	6 900
North West	12.9	130	9.2	38.5	8 101
Yorkshire and the Humber	10.8	130	8.4	36.8	8 304
East Midlands	9.0	135	7.3	45.6	7 894
West Midlands	9.1	142	7.8	40.0	7 260
East	13.5	175	6.8	46.1	6 437
London	12.3	250	–6.3	31.8	10 893
South East	22.0	203	4.2	40.0	7 172
South West	13.8	175	11.6	43.5	6 598
England	**107.3**	**170**	**6.5**	**37.8**	**7 883**
Wales	**6.4**	**133**	**12.7**	**40.4**	**7 404**
Scotland	**16.1**	**–**	**10.6**	**37.7**	**6 508**
Northern Ireland	**8.7**	**–**	**20.3**	**35.6**	**6 097**

Source: Adapted from Social Trends (41)

15 (a) Which **English Region** had the lowest level of 'recorded crime' in 2009?

[1 mark]

Answer .....

15 (b) Look at the values in the column headed 'Percentage increase in traffic between 1999 and 2009'.

Find the range of these percentages for the **English Regions**.

[2 marks]

.....

.....

Answer ..... %

15 (c) A statistician plans to draw a pie chart to compare the 'number of houses built' in 2009 for the four countries of the UK.

Calculate the angle for **Scotland**.
Give your angle to the nearest degree.

[4 marks]

.....

.....

.....

.....

Answer ..... degrees

END OF QUESTIONS

7

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED