



Rewarding Learning

Centre Number

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Candidate Number

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General Certificate of Secondary Education
2019

Statistics

Unit 2
Foundation Tier



GST21

[GST21]

THURSDAY 20 JUNE, MORNING

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.

Answer **all eleven** questions.

Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

You **may** use a calculator for this paper.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	

INFORMATION FOR CANDIDATES

The total mark for this paper is 80.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

You should have a calculator, ruler, compasses and protractor.

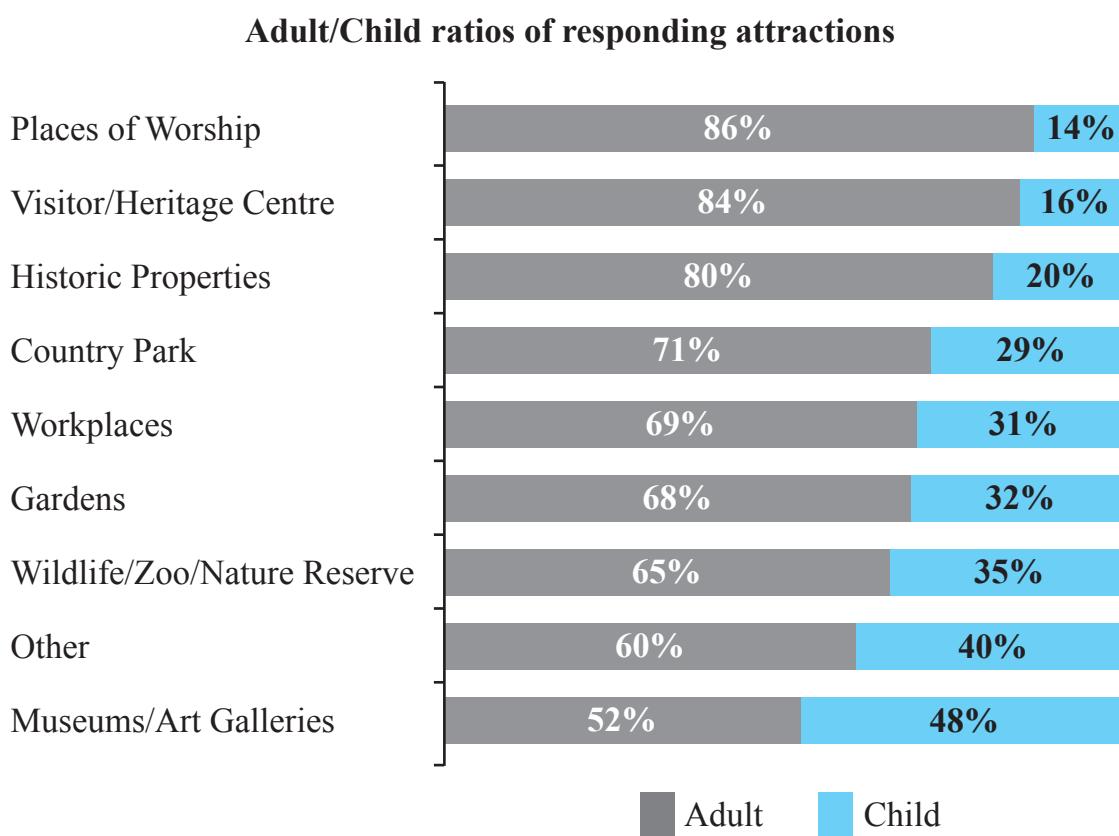
There is no formula sheet for this examination.

Total Marks	
-------------	--

Answer **all** questions

1 The compound bar chart below shows the Adult/Child ratios of visitors to a number of types of attraction in Northern Ireland during 2017

Examiner Only	
Marks	Remark



Total number of attractions supplying information (N=129).

(a) Write down the percentage of visitors to Historic Properties who were adults.

Answer _____ % [1]

Karen says,

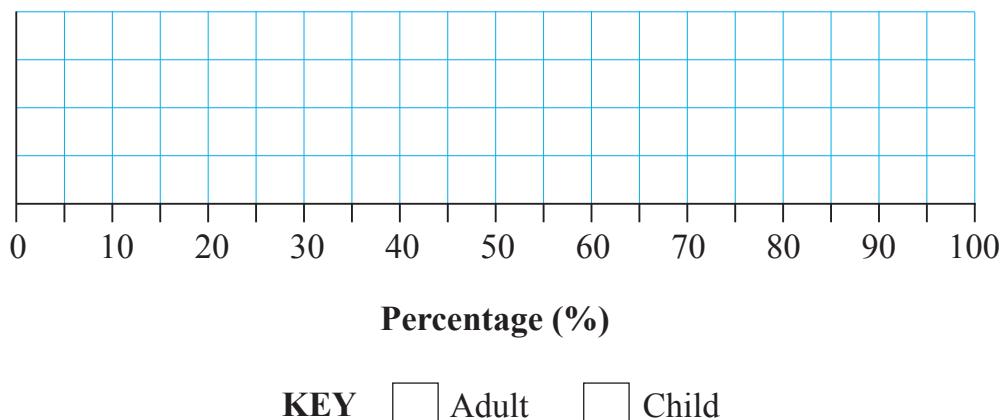
'The chart shows that Museums/Art Galleries are the most popular type of attraction among children.'

(b) Explain why Karen may not be correct.

[2]

For one attraction, 75% of visitors were adults.

(c) Show this information on a compound bar chart.



[3]

2 Neil is interested in finding out the reasons why people use the local park. He plans to ask 50 people in the park one Saturday morning to answer this question:

What is your main reason for using the park?

Exercise Dog walking Sport Don't use the park

(a) Give three reasons why the response section is not suitable.

1. _____

[1]

2. _____

[1]

3. _____

[1]

Neil decides to carry out a pilot survey.

(b) Explain what is meant by a pilot survey.

[2]

(c) Comment on Neil's method of sampling.

[2]

Examiner Only	
Marks	Remark

3 Lucy asked the pupils in her class about which visitor attractions they had been to in Belfast.

Her results are given in the table below.

Visitor attraction	Tally	Number of visits
W5		8
SS Nomadic		7
Titanic Belfast		4
Ulster Museum		2
	TOTAL	21

Lucy collected her data by asking each of the pupils in her class, one at a time.

(a) Has Lucy collected primary data or secondary data?

Primary data

Secondary data

[1]

(b) Give one reason why Lucy used a Tally column in her table.

[1]

(c) Complete the pictogram below to display the data in the table.

KEY  represents 2 pupils

W5	
SS Nomadic	
Titanic Belfast	
Ulster Museum	

[2]

(d) Write down the name of the modal visitor attraction.

Answer _____ [1]

Examiner Only	
Marks	Remark

(e) Why is it not possible to calculate the range for Lucy's data?

[1]

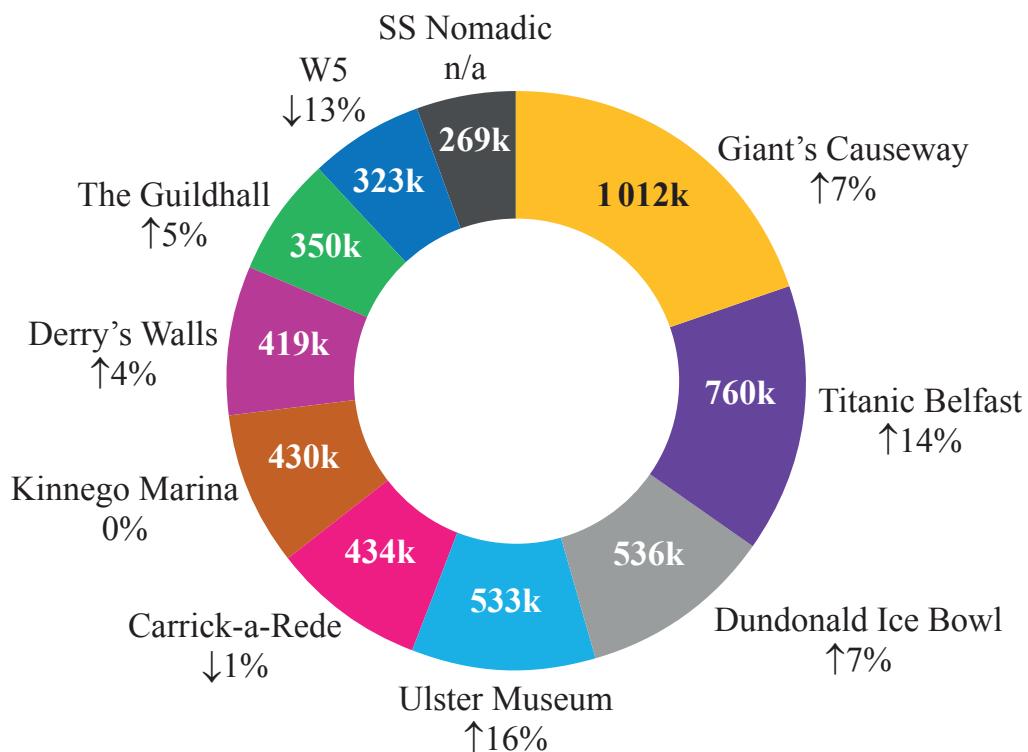
Lucy collected data from 17 pupils but she recorded 21 visits.

(f) Explain why these numbers are not the same.

[1]

Lucy finds the following chart on the website of the Northern Ireland Statistics and Research Agency.

Examiner Only	
Marks	Remark



Lucy notices that her data does not match the information in this chart.

(g) Give a reason how Lucy's data does not match the information in this chart.

[1]

4 The table below shows information about admission charges to tourist attractions in Northern Ireland between 2011 and 2017

Examiner Only	
Marks	Remark

Admission charges to responding attractions

Price of admission	Adult						
	2011	2012	2013	2014	2015	2016	2017
Maximum	£11.20	£17.50	£14.75	£15.50	£15.50	£20.00	£18.00
Minimum	£2.00	£1.00	£1.00	£1.60	£1.00	£2.00	£1.60
Mean	£4.60	£5.50	£4.75	£5.13	£5.74	£6.45	£5.93

Price of admission	Child						
	2011	2012	2013	2014	2015	2016	2017
Maximum	£5.70	£7.00	£7.25	£7.25	£8.50	£10.00	£8.00
Minimum	£1.50	£0.00	£0.00	£0.00	£1.00	£2.00	£0.50
Mean	£3.50	£2.80	£2.54	£2.88	£3.89	£4.14	£3.78

Total number of attractions supplying information (N=51).

(a) Is the data quantitative or qualitative?

Quantitative

Qualitative

[1]

Mick says that between 2011 and 2017, none of the 51 responding attractions offered free admission to adults.

(b) (i) Is Mick correct?

Yes

No

[1]

(ii) Explain your answer.

[1]

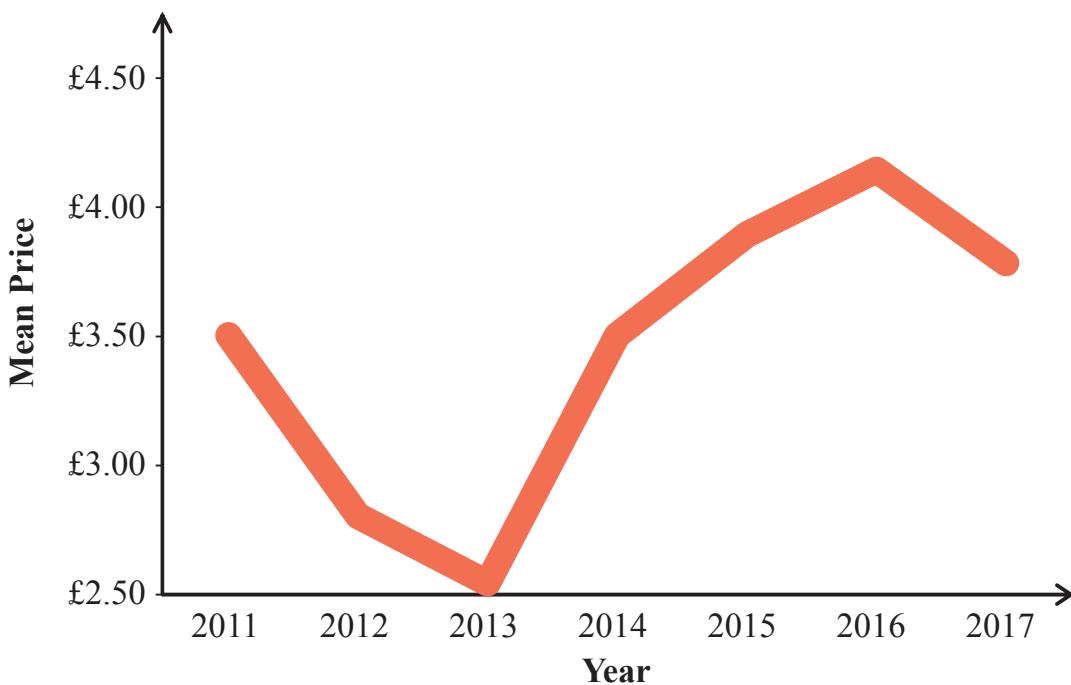
The table contains information about the mean price of admission.

(c) Give one reason why the median price of admission might also have been a useful average to include in the table.

[1]

Examiner Only	
Marks	Remark

Beth has drawn a graph showing the change in the mean price of admission for a child between 2011 and 2017



(d) Give three reasons why Beth's graph is misleading.

1. _____

[1]

2. _____

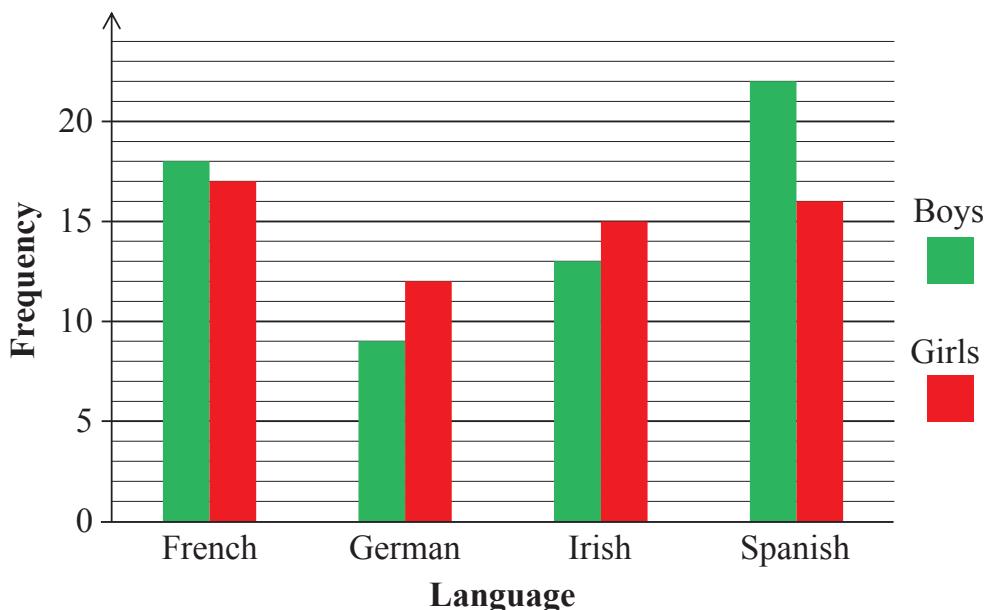
[1]

3. _____

[1]

Examiner Only	
Marks	Remark

5 The multiple bar chart below shows the number of pupils in Year 12 in a school who study the following languages: French, German, Irish and Spanish. The school only allows pupils to study one language.



(a) How many boys study German?

Answer _____ [1]

(b) Which language is the mode?

Answer _____ [1]

A pupil who studies French is chosen at random.

(c) What is the probability that this pupil is a girl?

Answer _____ [2]

A pupil who studies languages is chosen at random.

(d) What is the probability that this pupil does not study Spanish?

Answer _____ [2]

Examiner Only	
Marks	Remark

6 Twenty-four visitors to a museum were asked how they had travelled there.

The results are listed below.

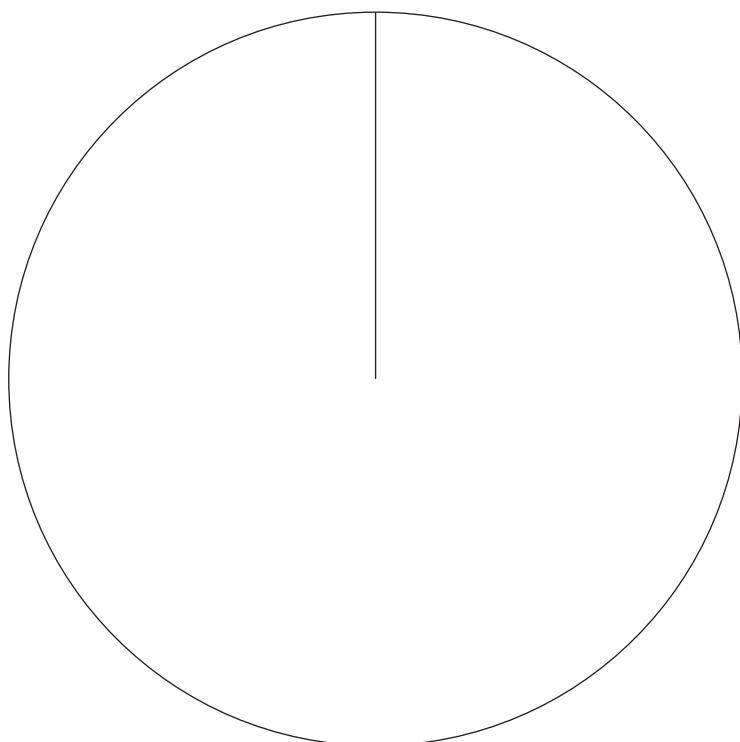
Bus	Bus	Walk	Bus	Car	Train
Bus	Car	Bus	Car	Train	Walk
Train	Bus	Walk	Walk	Car	Bus
Car	Walk	Bus	Train	Bus	Walk

(a) Complete the Tally and Frequency columns in the table below.

Method of travel	Tally	Frequency	
Bus			
Car			
Train			
Walk			

[2]

(b) Draw a pie chart to illustrate this information.



[4]

One afternoon there were 120 visitors to the museum.

(c) Estimate how many of the visitors travelled there by train.

Examiner Only	
Marks	Remark

Answer _____ [2]

7 For a survey about recycling a researcher emailed a questionnaire to 400 households.

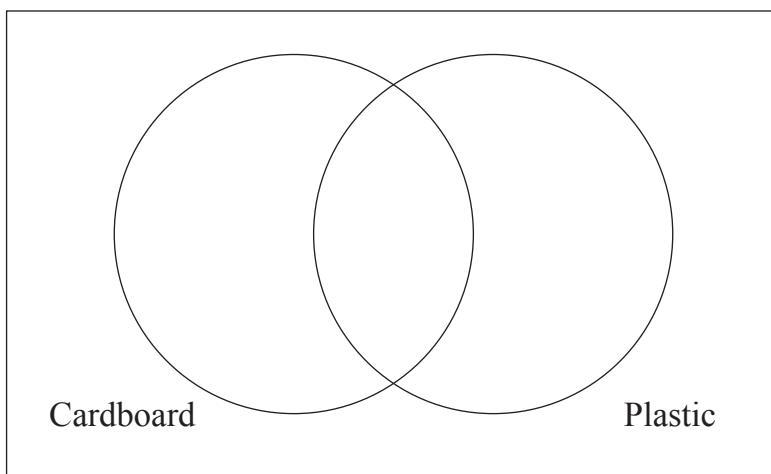
The researcher received 80 responses to the questionnaire.

(a) Suggest one way in which the response rate might have been improved.

[1]

Of the 80 responses received, 23 said they recycled cardboard only, 40 recycled plastic only and 8 recycled both.

(b) Show the above data in the Venn diagram below.



[2]

(c) Write down the number of respondents who did not recycle cardboard or plastic.

Answer _____ [1]

(d) One of the 80 responses is selected at random.

Find the probability that this household recycles cardboard.

Answer _____ [1]

8 The Visitor Attraction Survey is a census of all visitor attractions in Northern Ireland.

(a) Explain what is meant by the term census.

[1]

(b) Give one advantage and one disadvantage of taking a census.

Advantage _____

[1]

Disadvantage _____

[1]

(c) Suggest a reason why the Visitor Attraction Survey could be incomplete.

[1]

Electronic counters were used by 23% of attractions to record the numbers of visitors to them.

(d) (i) Explain how an electronic counter could over-count the number of visitors.

[1]

(ii) Explain how an electronic counter could under-count the number of visitors.

[1]

Examiner Only	
Marks	Remark

9 The mayor of a large town wishes to carry out a survey among visitors to the town.

He wishes to find out some of the reasons why people visit the town.

(a) Write down an example of a closed question which the mayor could include in a questionnaire.

You should include an appropriate response section.

Examiner Only	
Marks	Remark

[2]

(b) Give two reasons why closed questions are useful in a questionnaire.

1. _____

[1]

2. _____

[1]

The mayor intends to use quota sampling.

(c) (i) Explain what is meant by quota sampling.

[2]

(ii) Give a reason why the mayor could not use simple random sampling.

[1]

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(Questions continue overleaf)

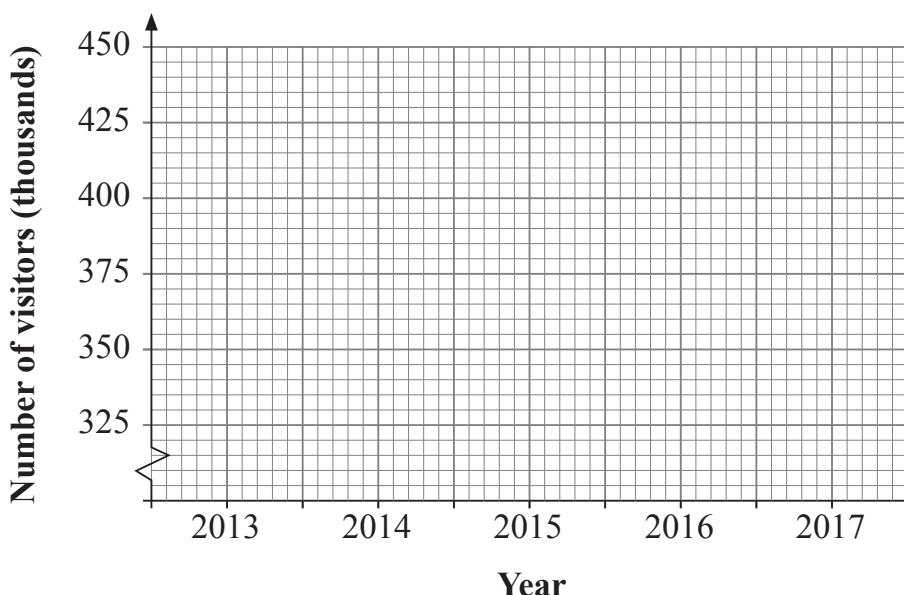
10 The table below shows the number of visitors, in thousands, to some visitor attractions in Northern Ireland between 2013 and 2017

		Examiner Only					
		Marks	Remark				

**Top ten participating visitor attractions
(excluding Country Parks/Parks/Forests/Gardens)**

		Number of visitors (thousands)				
		2013	2014	2015	2016	2017
1	Giant's Causeway World Heritage Site	754	788	851	944	1012
2	Titanic Belfast	604	634	622	667	760
3	Dundonald International Ice Bowl	n/a	n/a	n/a	500	536
4	Ulster Museum	416	466	465	460	533
5	Carrick-a-Rede Rope Bridge	263	324	354	440	434
6	Kinnego Marina	326	209	428	430	430
7	Derry's Walls	411	370	381	403	419
8	The Guildhall	269	299	313	334	350
9	W5	270	324	372	370	323
10	SS Nomadic	n/a	n/a	n/a	n/a	269

(a) Draw a line graph to show the number of visitors to Derry's Walls between 2013 and 2017



[3]

(b) (i) In which year did the fewest visitors come to Derry's Walls?

Answer _____ [1]

(ii) Explain how this is shown on the graph.

[1]

(c) Describe briefly the trend in the number of visitors to Derry's Walls over the five-year period.

[2]

Taking 2013 as the base year, Barry calculated index numbers for the number of visitors to Derry's Walls. His results were:

90.0 100 101.9 98.1 92.7

Barry has written these down in the wrong order.

(d) Complete the table below using Barry's values.

Year	2013	2014	2015	2016	2017
No. of visitors (thousands)	411	370	381	403	419
Index number					

[3]

11 Keith reads a report about visits to visitor attractions.

Examiner Only	
Marks	Remark

The report says:

- there were an estimated 15.0 million visits to visitor attractions in 2016; and
- there were a reported 19.8 million visits to visitor attractions in 2017 by respondents to a survey.

Keith decides to use the statistical enquiry cycle to investigate if there was an increase in the number of visits to all visitor attractions between 2016 and 2017

(a) Explain how Keith could plan his investigation.

Your answer should include:

- a suitable hypothesis for Keith's investigation
- what data Keith would need to collect
- a possible source for the data
- one problem Keith might encounter with his data collection and how this could be overcome.

[6]

Keith wants to analyse the data using diagrams and calculations.

(b) State one diagram and one calculation he could use and explain the reason for choosing each.

Diagram

Explanation

Calculation

Explanation

[4]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

Sources

Q3(g) . . . Source: Data from © Crown Copyright / NISRA www.nisra.gov.uk



General Certificate of Education
2019

Statistics

Pre-Release Materials for
Unit 2
Foundation and Higher

[GST21/GST22]

PRE-RELEASE MATERIALS

The Visitor Attraction Survey

The Northern Ireland Statistics and Research Agency (NISRA) use the statistical enquiry cycle to produce statistics on Tourism.

The Visitor Attraction Survey is carried out annually by NISRA. The primary purpose of the survey is to give an indication of how the tourism industry is performing in Northern Ireland.

The survey is issued by postal and electronic questionnaire and includes guidelines on how to complete it. The 2017 survey was issued to 400 attractions and 242 responded with data to analyse.

The Visitor Attraction Survey is a census of all Visitor Attractions in Northern Ireland.

An attraction is one which is listed on the Discover Northern Ireland website. This means that the survey may be incomplete because if the details of an attraction are not listed on the website, it may not be included in the survey.

The Northern Ireland Visitor Attraction Survey 2017 report presents findings about several aspects of tourism, such as: types of attraction, visitor numbers, residency of visitors and admission charges.

The method used to record visitor numbers varies by attraction.

Method of recording visitor numbers (2017)

Method used	%
Ticket or group bookings	32%
Manual count	22%
Mechanical or electronic	23%
Estimate	19%
Sample count	4%
Other	1%
Total (221 responding attractions)	100%

Totals may not add to 100% due to rounding.

Data Quality Report

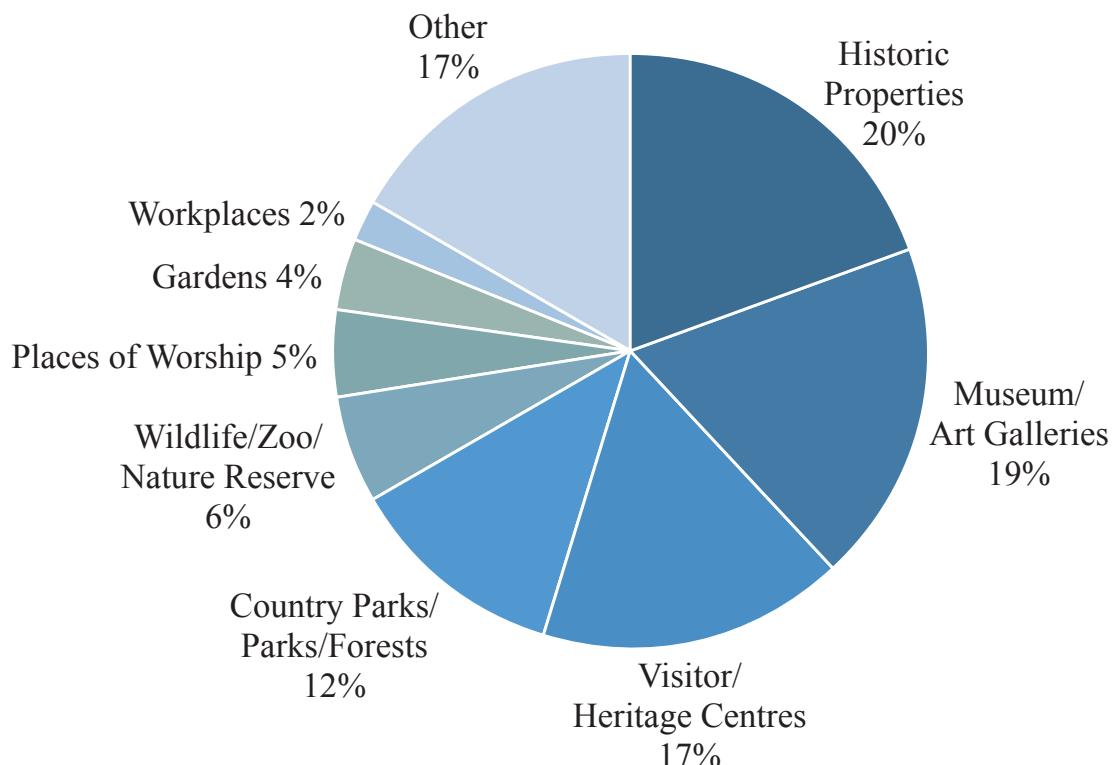
Relevance	Primary Purposes	The primary purpose of the Visitor Attraction Survey is to give an indication on how the tourism industry is performing in Northern Ireland by the number of visits to local attractions.
	Strengths	The Visitor Attraction Survey gives an indication of how tourism is performing locally. The surveys are completed by the attractions themselves so can give indications on external factors influencing tourism.
	Limitations	As the Visitor Attraction Survey is completed by each attraction, the reliability of the figures can vary. Some attractions do use ticket sales, but others provide estimates or use “electronic counters” which may also count commuters or day-to-day use.
	Annual	The results of the survey are published annually and contain estimates relating to the latest year. They are published approximately five to six months after the end of the year.
Content and Development	Questionnaire	The Visitor Attraction Survey is issued by questionnaire both postal and electronically by email. Guidelines for completion and contact details are issued alongside the questionnaire for anyone who has queries or requires assistance to fill out the form.
	Data Validation Methods	NISRA carry out sense checks on the data by comparing yearly data. Quite often changes arise due to different data collection methods or different people filling in the surveys.
Accuracy	Errors	There are likely to be lots of errors in the Visitor Attraction Survey results as each attraction has a different method of counting visitors. Some variations in results may be due to data collection methods. There are some attractions that report visitors by ticket sales. However, there are others who estimate their figures. Other attractions may have “electronic counters” which count the number of people who pass them. There are pros and cons with these counters as they provide an estimate. However, they may over count (if someone passes more than once or if they include people passing the counter who are not visitors) or undercount (if a large group pass the counter at one time they might not all be included).

Number of attractions by Attraction Category

Attraction Category	Number of Attractions	(%)
Country Parks/Parks/Forests	30	12%
Gardens	9	4%
Historic Properties	48	20%
Museum/Art Galleries	45	19%
Visitor/Heritage Centres	40	17%
Wildlife/Zoo/Nature Reserve	14	6%
Workplaces	4	2%
Places of Worship	11	5%
Other	41	17%
Total	242	100%

Totals may not add to 100% due to rounding.

Responding attractions by category type

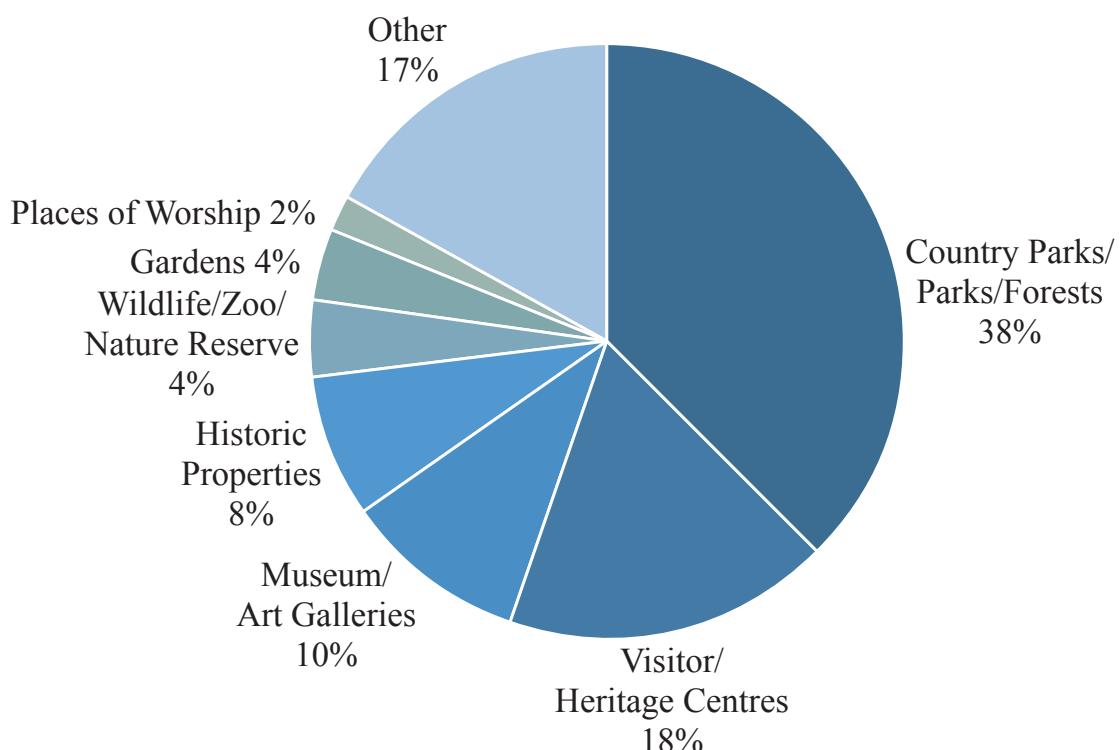


Number of visits by Attraction Category

Attraction Category	Number of Visitors	(%)
Country Parks/Parks/Forests	7 449 056	38%
Gardens	7 109 17	4%
Historic Properties	1 487 281	8%
Museum/Art Galleries	1 988 766	10%
Visitor/Heritage Centres	3 573 844	18%
Wildlife/Zoo/Nature Reserve	785 290	4%
Workplaces	17 737	<1%
Places of Worship	444 191	2%
Other	3 303 241	17%
Total (242 responding attractions)	19 760 323	100%

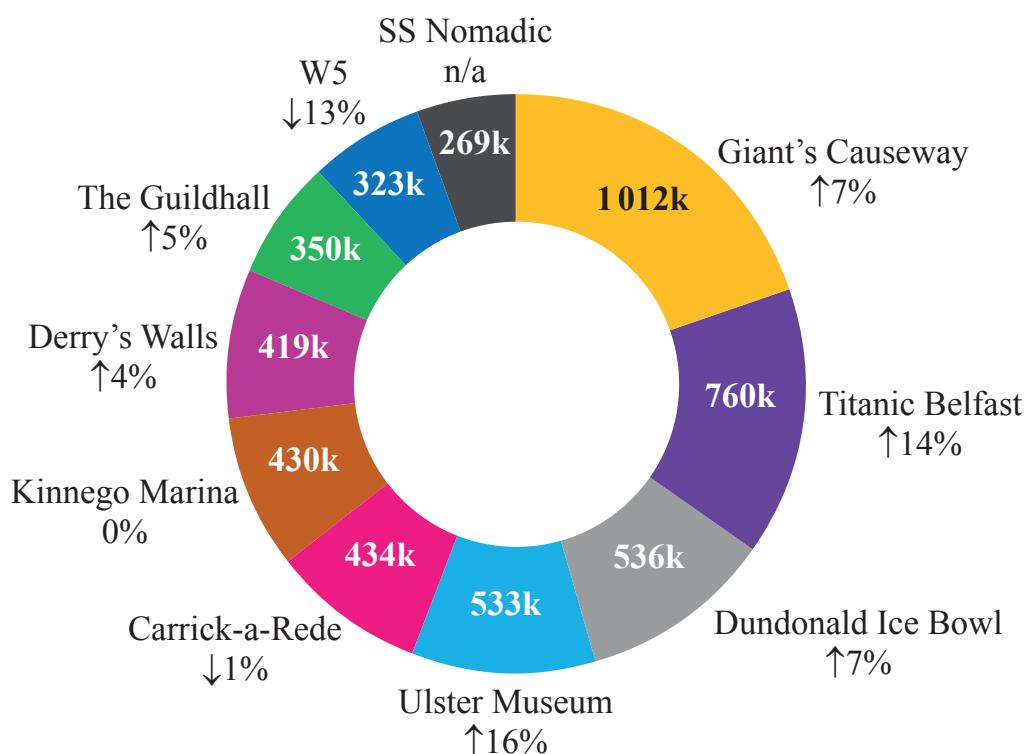
Totals may not add to 100% due to rounding.

Visits by category type



Top ten participating visitor attractions (excluding Country Parks/Parks/Forests/Gardens)

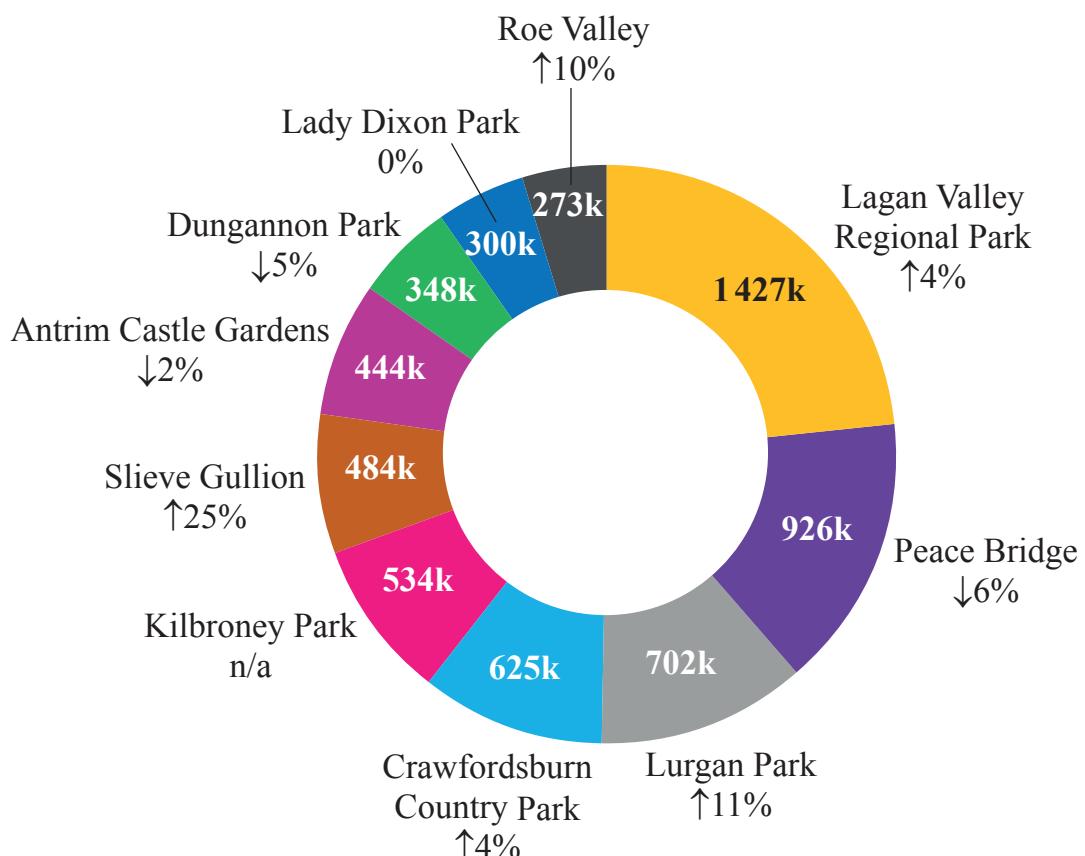
		Number of visitors (thousands)				
		2013	2014	2015	2016	2017
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2	Titanic Belfast	604	634	622	667	760
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8	The Guildhall	269	299	313	334	350
9	W5	270	324	372	370	323
10	SS Nomadic	n/a	n/a	n/a	n/a	269



Arrows indicate increase or decrease between 2016 and 2017.

Top ten participating visitor attractions (Country Parks/Parks/Forests/Gardens)

		Number of visitors (thousands)				
		2013	2014	2015	2016	2017
1	Lagan Valley Regional Park (inc. Lagan Towpath)	1 397	1 257	1 296	1 375	1 427
2	Peace Bridge	1 243	1 071	981	981	926
3	Lurgan Park	770	784	n/a	634	702
4	Crawfordsburn Country Park	800	748	585	603	625
5	Kilbroney Park	115	95	122	124	534
6	Slieve Gullion Forest Park & The Giant's Lair	n/a	311	361	388	484
7	Antrim Castle Gardens	168	221	343	451	444
8	Dungannon Park	224	332	291	368	348
9	Sir Thomas & Lady Dixon Park	300	300	270	300	300
10	Roe Valley Country Park	250	250	250	248	273



Arrows indicate increase or decrease between 2016 and 2017.

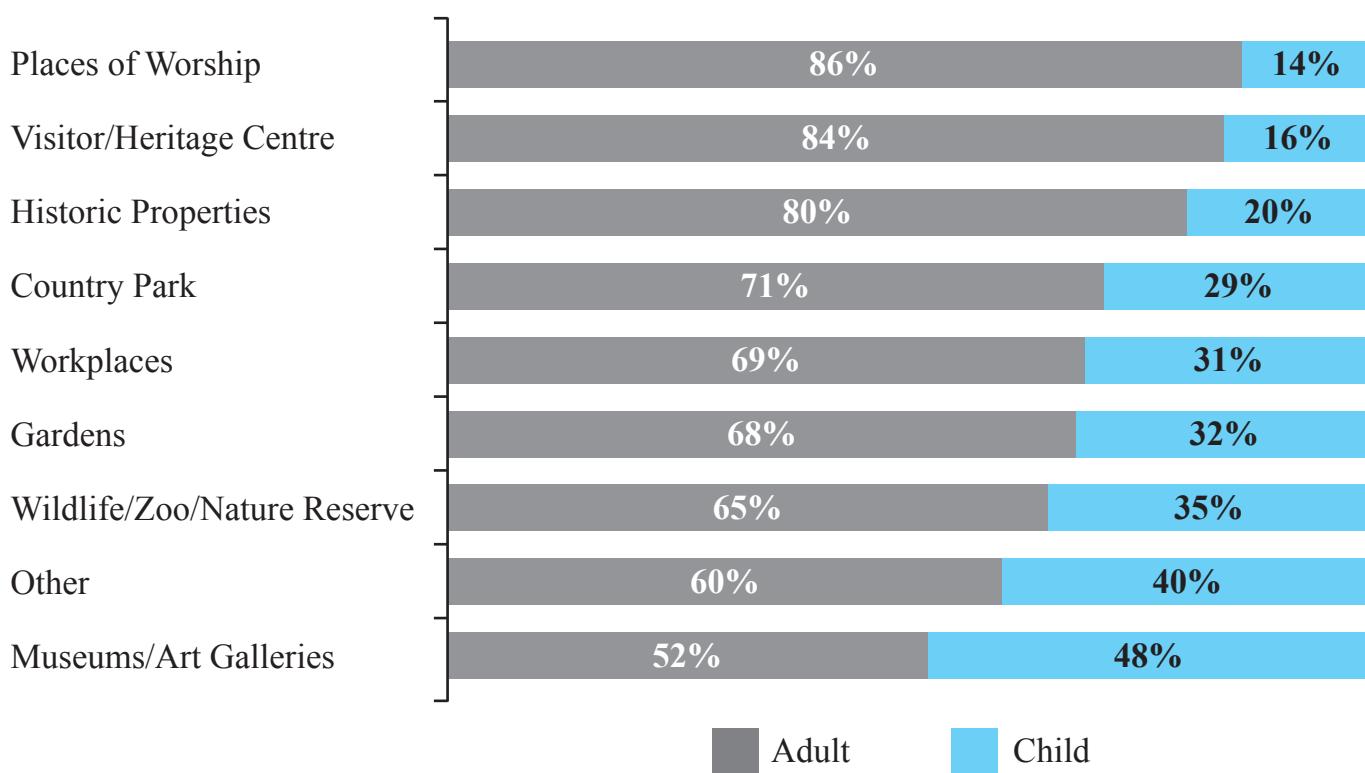
Admission charges to responding attractions

Price of admission	Adult						
	2011	2012	2013	2014	2015	2016	2017
Maximum	£11.20	£17.50	£14.75	£15.50	£15.50	£20.00	£18.00
Minimum	£2.00	£1.00	£1.00	£1.60	£1.00	£2.00	£1.60
Mean	£4.60	£5.50	£4.75	£5.13	£5.74	£6.45	£5.93

Price of admission	Child						
	2011	2012	2013	2014	2015	2016	2017
Maximum	£5.70	£7.00	£7.25	£7.25	£8.50	£10.00	£8.00
Minimum	£1.50	£0.00	£0.00	£0.00	£1.00	£2.00	£0.50
Mean	£3.50	£2.80	£2.54	£2.88	£3.89	£4.14	£3.78

Total number of attractions supplying information (N=51).

Adult/Child ratios of responding attractions



Total number of attractions supplying information (N=129).

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Sources

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