

Test of Hypothesis – GCSE Statistics**1. No.14**

Tom is doing a statistical study into the amount of homework received by Year 7 and Year 11 students in his school.

- (a) Write down a hypothesis Tom could use.

[1 mark]

- (b) State the population of his study.

[1 mark]

- (c) Tom wants a sample of Year 7 students and a sample of Year 11 students to complete a questionnaire for him.

He considers these three sampling methods for Year 7 students.

Method A

Number all the students in Year 7.

Obtain 30 random numbers.

Ask the students whose random numbers come up to complete the questionnaire.

Method B

Wait outside the dinner hall.

Ask the first 30 Year 7 students he sees to complete the questionnaire.

Method C

Choose three Year 7 students from each of the 10 maths sets.

Ask these students to complete his questionnaire.

Name and compare the merits of each sampling method.

Make a reasoned choice of which method Tom should use.

[7 marks]

[illegible]

(d) One of Tom's questions is,

'How much homework do you receive?'

Write down **two** problems with this question.

[2 marks]

Problem 1 _____

Problem 2 _____

(e) Tom improves his questionnaire and collects his data.

He finds that:

- on average Year 7 have five hours of homework per week
- on average Year 11 have eight hours of homework per week.

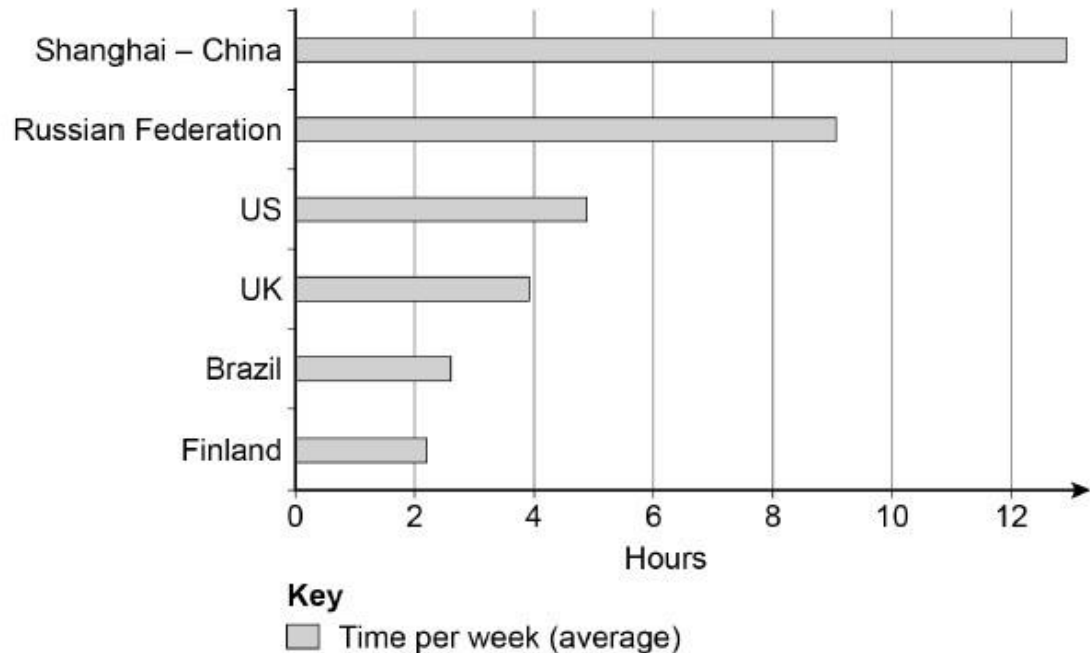
Write a possible conclusion for Tom.

[1 mark]

- (f) Tom wonders how this compares with other schools in the UK and schools in other countries.

He finds this chart on the internet but it has no source.

How much time do 15-year-olds spend on homework?



Use the chart to compare Tom's Year 11 results of an average of 8 hours homework per week with those for other schools in the UK and with other countries.

[2 marks]

Tom's school and other UK schools _____

Tom's school and schools in other countries _____

(g) Why are Tom's data and the internet data not completely comparable?

[1 mark]

(h) Is Tom's data or the internet data more reliable?

Give a reason for your answer.

[1 mark]

2. No.5

A sample of 670 adults in England were asked what side order they preferred at fish and chip shops.

A striped area indicates two equally popular side orders.



(a) Based on area of land, which is the most popular side order?

[1 mark]

Answer _____

- (b) Give **two** reasons why your answer to (a) might not be the side order that **most** people eating fish and chips in England prefer.

[2 marks]

1 _____

2 _____

3. No.12

Ashwen and his family are going on holiday.

His father hopes to persuade Ashwen to go camping in England.

Ashwen investigates whether camping is the most popular type of holiday in England.

- (a) Write down a possible hypothesis for Ashwen to use.

[1 mark]

- (b) Ashwen asks some of the students he meets around school whether they are going on holiday in England this year, and, if so, what type of holiday it will be.

- (b) (i) Name the sampling method Ashwen is using.

[1 mark]

Answer _____

(b) (ii) Give **one** advantage and **one** disadvantage of Ashwen using this method.

[2 marks]

Advantage _____

Disadvantage _____

(b) (iii) Ashwen's teacher suggests random sampling would have been a better method.

Describe how Ashwen could obtain a random sample from his school.

[3 marks]

(c) Ashwen wants to collect data from at least 30 students.

Give **two** reasons why he should have an initial sample size greater than this.

[2 marks]

Reason 1 _____

Reason 2 _____

- (d) Ashwen finds that 4 out of 40 of the students he asks, who are going on holiday in England, are going camping.

Comment on this result in the light of your hypothesis in **part (a)** and his father's hopes.
[2 marks]

- (e) Ashwen's father is also trying to decide **when** to go on holiday.
He goes to the Visit England website and finds these data for 2017.

Holidays – England	Trips	Nights	Spend
	Million	Millions	£Millions
Month Trips Started			
January 2017	1.77	3.91	£421
February 2017	2.11	5.37	£414
March 2017	3.03	8.12	£665
April 2017	4.54	14.17	£928
May 2017	4.54	14.99	£1038
June 2017	4.44	14.99	£1115
July 2017	5.77	26.53	£1559
August 2017	7.45	30.20	£1802
September 2017	4.28	14.26	£991
October 2017	4.01	11.92	£926
November 2017	2.69	6.61	£563
December 2017	2.62	6.75	£600

- (e) (i) Use the information in the table to show that the average spend per trip started in January is £238 to the nearest pound.

[1 mark]

- (e) (ii) Why is this value approximate?

[1 mark]

(e) (iii) Estimate the average spend per trip started in **August**.

Give your answer to the nearest pound.

[2 marks]

Answer _____

(e) (iv) Compare your values for January and August.

Give a possible reason for any difference you find.

[2 marks]

Comparison _____

Possible reason _____
