Name:_____

Statistics Summer Homework

AN INTRODUCTION TO A LEVEL STATISTICS

At the start of your A level Statistics course, you will be asked to collect a set of data, and then use various statistical techniques to analyse it. In order to do this, we will be reviewing and building upon the statistics you have already studied as part of your GCSE maths course.

In this task, you will practice analysing some of the data presentation and probability content you will be familiar with from GCSE, and practice the key skills of analysis and explanation. In A-level, we will examine lots of new probability and data distributions, but retaining the need to analyse them critically and with context like in this task.

If you aren't familiar with a topic in this task, then see if you can find out by looking at online GCSE maths resources such as Mymaths, Corbettmaths, or MathsGenie. You should aim to have every question answered before your first Statistics lesson.
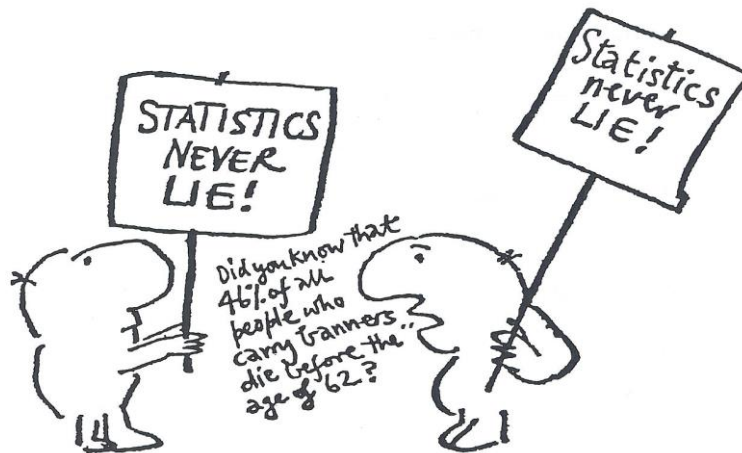
Section 1: Probability

1. An event is more likely to happen than not.

Circle a possible probability of the event happening.

$$0 \qquad \frac{2}{7} \qquad 60\% \qquad 1.4$$

2. In a charity raffle 500 tickets are sold. The prizes are:

- One holiday in Florida
- Four weekend breaks in the UK
- 15 cash prizes of £50

Tickets are chosen at random for the prizes.

Emma has one ticket.

a)   Write down the probability that Emma wins the holiday in Florida.

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b)   Work out the probability that Emma does **not** win any of the prizes.

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c)   Work out the probability that Emma wins at least one prize if she buys two tickets.

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3. Darcey sometimes goes to the gym after work.

The probability of going to the gym is affected by whether she arrives home early or late.

The probabilities are shown in the tree diagram.
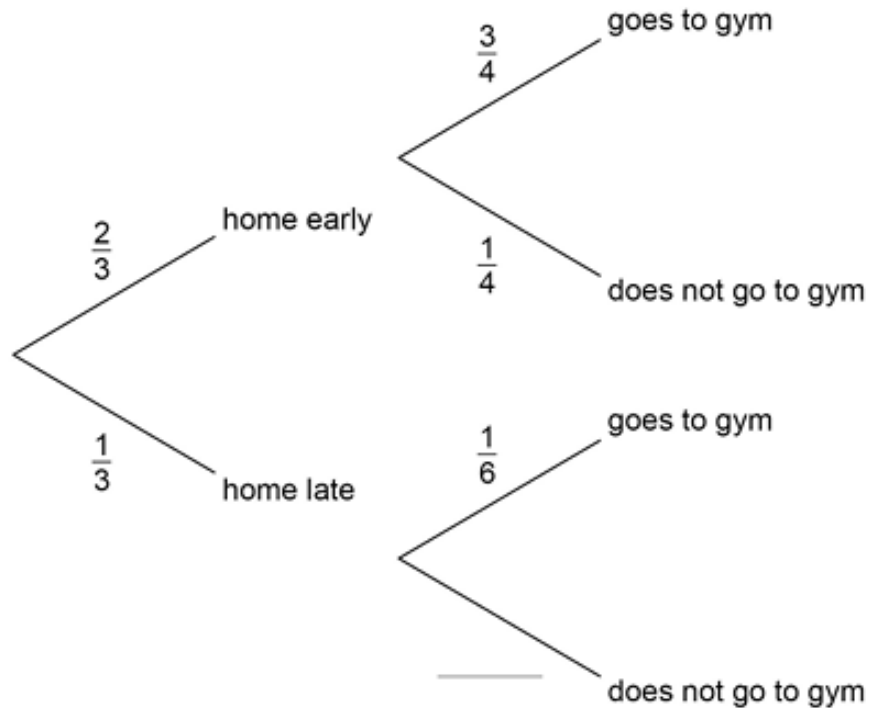
a)   Write the missing probability on the tree diagram.

b)   What does the probability of ¾ represent in this context?

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c)   Calculate the probability that, on a randomly chosen work day, Darcey will get home late and go to the gym.

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d)   Next year Darcey will work 225 days. She only goes to the gym on a work day.

        Estimate the number of times Darcey will go the gym next year.

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Section 2: Data & Numerical Measures

1. Which of these is **qualitative** data about a horse?

The length of the horse's face   The age of the horse

The mass of the horse   The colour of the horse

2. As part of a school project, Hakeeb asks 10 of his friends to write down how many hours they slept last Sunday night. These are the 10 values given by his friends:

  6   8   6   480   7   9   7   8.5   8   6

a)   Identify the value which appears to be incorrect. _____

b)   Suggest, in context, what might have happened and write down the correct value.

_____

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c)   Find the median number of hours that students in the sample slept last Sunday night.

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d) Hakeeb calculates this median correctly and claims 'this shows that the average student sleeps for less than 8 hours every night."

State one assumption that Hakeeb has made.

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3. Dr Cho runs a clinic where each appointment is meant to be 5 minutes.

She thinks that some doctors at the clinic are spending much longer than 5 minutes with a patient.

a) The table shows information about the actual lengths, in minutes, of appointments for one day.

Length, t (mins)	Frequency		
$0 < t \leqslant 2$	8		
$2 < t \leqslant 4$	44		
$4 < t \leqslant 6$	43		
$6 < t \leqslant 8$	11		
$8 < t \leqslant 10$	10		

Dr Cho says,

"The data show that the mean length of an appointment is longer than 5 minutes."

Calculate an estimate of the mean length of appointment to decide if she is correct.

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b)   Dr Cho wants to investigate any relationship that might exist between the length of an appointment and the age of the patient.

She collects data from a random sample of 20 patients.

The scatter diagram shows 15 of the results. The table shows the remaining 5 results.

| Age of patient (years)	12	26	40	55	76
Length of appointment (minutes)	3.1	2.4	4.5	2.5	5.8

b) (i) Use the data in the table to complete the scatter diagram.
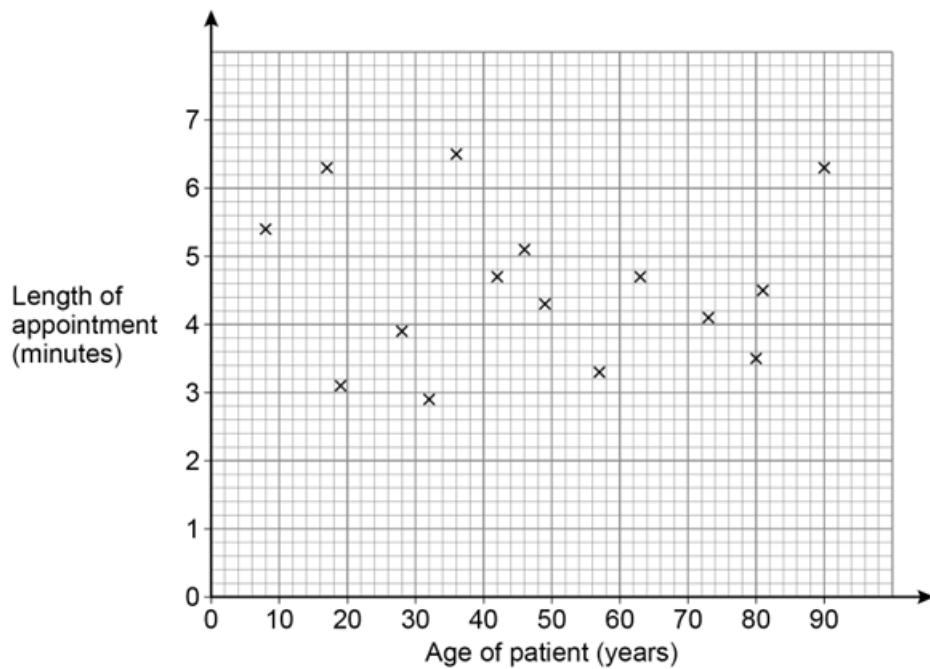
b) (ii) Dr Cho says that she can predict the length of an appointment if she knows the age of a patient.

Comment on her statement.

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4. The equal-width histogram shows information about the length of 100 Vlogs (video blogs) about **gaming**.

Length of Vlog, t (minutes)
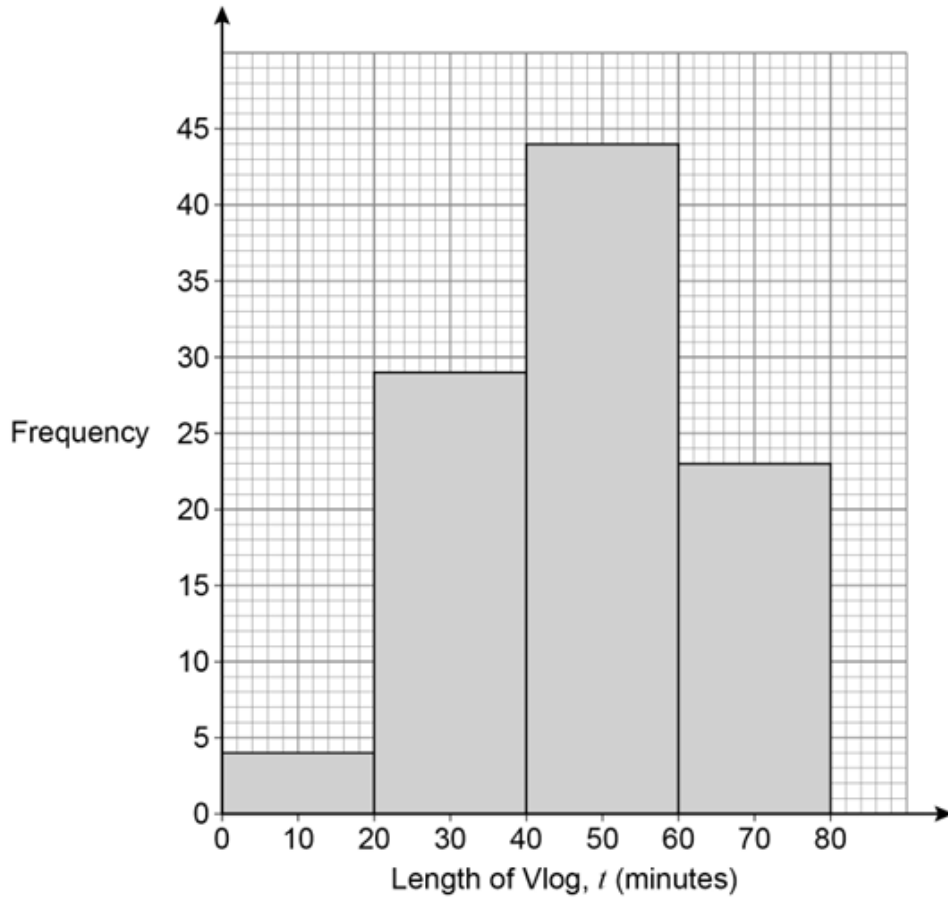
a)   What is the length of the longest of these 100 vlogs?

     44 minutes   79 minutes   80 minutes   Cannot tell

b)   Complete the grouped frequency table for these 100 gaming vlogs.

Length of Vlog, t (minutes)	Frequency
$0 < t \leqslant 20$	4
$20 < t \leqslant 40$	
	44

c)   This table shows information about the length of 100 vlogs about **fashion**.

Length of Vlog, t (minutes)	Frequency
$0 < t \leqslant 20$	38
$20 < t \leqslant 40$	45
$40 < t \leqslant 60$	17
$60 < t \leqslant 80$	0

Make two comparisons about the length of the gaming vlogs with the length of fashion vlogs.

One of your comparisons should include a measure of average.

Comparison 1:

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Comparison 2:

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A final thought from Mark Twain.

"Get the facts first, and then you can distort them as much as you please."