

1. The table shows the mean daily temperatures at each of the eight weather stations for August 2015

	Camborne	Heathrow	Hurn	Leeming	Leuchars	Beijing	Jacksonville	Perth
Mean daily mean temp °C	15.4	18.1	16.2	15.6	14.7	26.6	26.4	13.6

- a) Give a geographical reason why the temperature in August might be lower in Perth than in Jacksonville
- b) Comment on whether this data supports the conclusion that coastal locations experience lower average temperatures than inland locations.

2. Harriet believes that the random sample S, representing total daily hours of sunshine from the large data set, can be modelled by a discrete uniform distribution, once S has been rounded to the nearest integer.

- a) Write down the probability distribution of S
- b) Using this model, find the probability that the total daily hours of sunshine is less than 10
- c) State what makes Harriet’s assumption very unlikely
- d) Suggest a refinement to Harriet’s model.

3) Joshua compares the amount of rain in 2015 between Heathrow and the city X on the continent of Asia using the Large Data Set.

(a) Write down the name of the city X that Joshua compares with Heathrow.

At random, he selects 8 data points about the daily total rainfall, in mm, in May 2015 for the two cities.

These 8 data points are shown below.

Heathrow: 7.0 0.2 1.2 tr 0.8 6.8 0.2 4.2

City X: 6.0 0.0 20.7 9.0 14.3 0.5 0.0 0.4

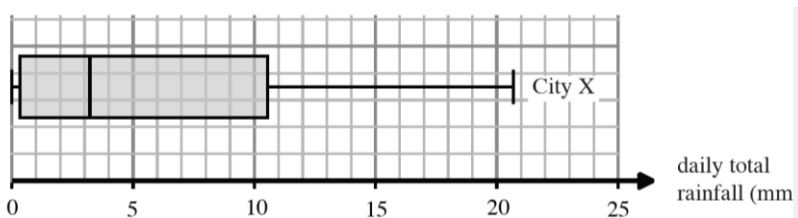
(b) Explain what is meant by the reading ‘tr’.

(c) State **one**

- (i) advantage
- (ii) disadvantage

of Joshua using 8 data points from the large data set for his comparisons.

The diagram below shows a box-plot for the data collected by Joshua on the rainfall in the city X in May 2015.



Draw another box-plot to represent the data collected by Joshua for Heathrow. In your data processing, take ‘tr’ to mean 0.0 mm of rainfall and ignore outliers.

(e) Compare the amount of rainfall in May 2015 between Heathrow and the city X.

1. a) Perth is in the Southern hemisphere so August is a winter month
- b) The lowest temperatures in the U.K. are at coastal locations (Camborne and Leuchars). The highest temperature is at an inland location (Beijing). There is some evidence to support this location although a greater sample size of different locations would lead to a more accurate conclusion.

2. a)

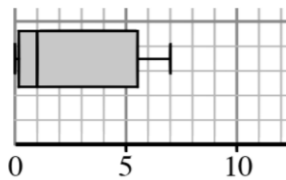
s	0	1	2	3	4	5	6	7	8	9	10	11	12
P(S=s)	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$

s	13	14	15	16	17	18	19	20	21	22	23	24	
P(S=s)	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	$\frac{1}{25}$	

- b) $\frac{2}{5}$
- c) None of these cities are in the Arctic Circle so there will always be some hours when the sun has set – so the maximum number will never be 24
- d) The number of hours of sunshine will vary from month to month and place to place
So e.g. use a non-uniform distribution.

3. a) Beijing

- b) tr means a rainfall of less than 0.05 mm
- c) i) large data set has many more than 8 data points, so using 8 points is easier to process, it is quicker to process and requires less analysis
- ii) large data set has many more than 8 data points, so using 8 points may not very representative and may lead to inaccurate and unreliable conclusions
- d)



- e) Heathrow had less rainfall on average than City X as the median is lower; Heathrow had less variation in the amount of rainfall it received than City X, as the Interquartile range and the range is smaller