



A Level Large Data Set

Practice Questions



| Question | Scheme |
|---------------|--|
| 1 | |
| (a) | Mean rainfall = $\frac{0.025(7)+1.5(4)+3(3)}{7+4+3} = \underline{1.083\dots}$ mm |
| | Standard deviation = $\sqrt{\left(\frac{0.025^2(7)+1.5^2(4)+3^2(3)}{7+4+3}\right) - (1.083\dots)^2} = \underline{1.182\dots}$ mm |
| (b) | Rainfalls between (about) $0 \leq r \leq 2.26$ mm are within one standard deviation of the mean |
| (c/i) | Not suitable because her sample only consisted of 14 days from one location and from one month |
| (c/ii) | e.g. Use more data from more UK locations and months |
| | Must reference UK locations |

| Question | Scheme |
|------------|---|
| 2 | |
| (a) | e.g. Cloud cover <p style="text-align: right;">Accept 'Daily mean windspeed on the Beaufort scale'</p> |
| (b) | <ul style="list-style-type: none"> • Generate (some) two digit random numbers • Enumerate the data points. For each random number chosen, select the corresponding data point on the enumerated list. • If the random number does not correspond to a data point (due to gaps or being out of range), ignore it and choose another. If a random number is repeated, ignore it and choose another • Continue in this way until 15 data points are chosen |
| (c) | Not reliable since he only used 15 data points, which is unlikely to be a good representation of the weather in Lemming in 2015 |
| (d) | The large data set only contains data for the months May-October and not the whole year |

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| 3 | |
| (a/i) | The large data set contains data for the months May-October and there are 184 days between (1 st) May and (31 st) October. |
| (a/ii) | e.g. The large data set contains gaps |
| (b) | (Starting from 1 st May), each day the total amount of rainfall in Leuchars in 2015 <u>decreases</u> by 0.0027 mm |
| (c) | $x = 3 \Rightarrow T = 16.551 - 0.0027(3) = \underline{16.5429}$ |
| (d) | <p><i>Idea that</i> The daily mean rainfall in Leuchars (in 2015) does not decrease at a steady rate, but fluctuates</p> <p>IGNORE references to 'extrapolation' – the question asks for discussion about the unreliability for any day in Leuchars in 2015, not just those outside of the data range</p> |

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|------------|---|
| 4 | |
| (a) | <u>Simple random sampling</u> |
| (b) | e.g. <u>easier/quicker/etc.</u> to process / analyse/etc. the data <u>since the large data set has a lot of data points</u> |
| (c) | 4 |
| (d) | <i>Idea that</i> The large data set does not contain information on cloud cover for Beijing |

| Question | Scheme |
|------------|--|
| 5 | |
| (a) | Temperature outliers are $T < 5$ and $T > 37.8$ Pressure outliers are $p < 993$ and $p > 1025$ But all values of T are between 9.7 and 27.2, so there are no temperature outliers and all values of p are between 994 and 1017, so there are no pressure outliers |
| (b) | <u>Negative</u> <p style="text-align: right;">Ignore quantifiers e.g. 'weak, strong'</p> |
| (c) | For every 1 °C increase in the temperature (in 2015 in Beijing), the pressure <u>decreases</u> by 0.71 |
| (d) | $p = -0.71(8.5) + 1022 = \underline{1015.965}$ hPa |
| (e) | Unreliable because the large data set only contains data for May-October, and so December is outside of the data range (used to produce the regression line) <p style="text-align: right;">Accept 'extrapolation' but they must make reference to the fact that the LDS only contains data for May-October</p> |
| (f) | Use a greater number/sample size of days from <u>Beijing</u> <p style="text-align: right;">No marks for reference to 'Asia'/'other places', since Beijing is the only place in Asia the LDS has data for</p> |
| (g) | <i>Idea that</i> he should consider data from other places in Asia, but Beijing is the only place in Asia that the LDS has data for |

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|----------|---|
| 6 | $8.45 \times 1.15 = \frac{194.35}{n}$ $\Rightarrow n = \frac{194.35}{8.45 \times 1.15} = 20$ <p>so the size of Zain's sample is 20</p> <p style="text-align: right;">[Here it has been used that 1knot = 1.15 mph]</p> |