

3. Kathleen is investigating the weather for Heathrow from May to October 2015.

She uses the large data set and produces the summary statistics below for the daily mean temperature ($t^{\circ}\text{C}$).

$$n = 184 \qquad \sum t = 2876.7 \qquad \sum t^2 = 46797.3 \qquad \text{Maximum} = 28.7$$

Kathleen defines limits for outliers for each variable using the mean ± 3 times standard deviation rule.

(a) Show that $t = 28.7$ is an outlier. (3)

Kathleen plans to produce summary statistics for the other weather variables recorded for Heathrow.

(b) Giving a reason for your answer, state a numerical weather variable from the large data set for which her outlier rule will not give practically useful results. (2)

Kathleen summarised the daily mean visibility for Heathrow from May to October 2015 in the table below.

Daily mean visibility (x decametres)	Number of days
$400 \leq x < 1200$	7
$1200 \leq x < 2000$	24
$2000 \leq x < 2400$	32
$2400 \leq x < 2800$	40
$2800 \leq x < 3200$	30
$3200 \leq x < 3600$	26
$3600 \leq x < 4400$	25

(c) Use linear interpolation to find an estimate of the lower quartile. (2)

Question 3 continued

Another student, Mason, calculated the mean and standard deviation of the daily mean temperature ($^{\circ}\text{F}$) in Jacksonville from May to October 2015.

$$\text{Mean} = 76.7^{\circ}\text{F}$$

$$\text{Standard deviation} = 4.86^{\circ}\text{F}$$

The formula to convert C degrees Celsius to F degrees Fahrenheit is $F = 1.8C + 32$

(d) Find, in degrees Celsius,

(i) the mean

(ii) the standard deviation

of the daily mean temperature in Jacksonville from May to October 2015.