3. Stav is studying the large data set for September 2015

He codes the variable Daily Mean Pressure, x, using the formula $y = x - 1010$

The data for all 30 days from Hurn are summarised by

$$\sum y = 214 \qquad \sum y^2 = 5912$$

(a) State the units of the variable x

(a) Knowledge of large data set
⇒ Hectopascal or hPa (1 mark)

(1)

(b) Find the mean Daily Mean Pressure for these 30 days.

(b) $\bar{y} = \frac{\sum y}{n} = \frac{214}{30}$ / $\bar{y} = \bar{x} - 1010 \Rightarrow \bar{x} = \bar{y} + 1010 = \frac{214}{30} + 1010$ (2 marks)
$= 1017.3...$
$= 1017$ 4sf

(2)

(c) Find the standard deviation of Daily Mean Pressure for these 30 days.

(3)

Stav knows that, in the UK, winds circulate
- in a **clockwise** direction around a region of **high** pressure
- in an **anticlockwise** direction around a region of **low** pressure

The table gives the Daily Mean Pressure for 3 locations from the large data set on 26/09/2015

Location	Heathrow	Hurn	Leuchars
Daily Mean Pressure	1029	1028	1028
Cardinal Wind Direction			

The Cardinal Wind Directions for these 3 locations on 26/09/2015 were, in random order,

W   NE   E

You may assume that these 3 locations were under a single region of pressure.

(d) Using your knowledge of the large data set, place each of these Cardinal Wind Directions in the correct location in the table.
Give a reason for your answer.

(2)

(C) standard deviations for x & y, σ_x & σ_y are the same, because coding involving only addition does not affect σ (1 mark)

Variance = mean of squares − square of mean = $\frac{5912}{30} - \left(\frac{214}{30}\right)^2 = \frac{32891}{225}$

Standard Deviation = $\sqrt{\text{Variance}} = \sqrt{\frac{32891}{225}} = 12.090... = 12.1$ 3sf (2 marks)

(d)

from earlier in Q. $\mu = 1017$ & $\sigma = 12.1$, so 1028 & 1029 are High pressures
⇒ wind circulates clockwise (around UK)
⇐ Knowledge of large data set
from NE   (2 marks)
from E