Measures of location and spread 2F

1 a $11 + 9 + 5 + 8 + 3 + 7 + 6 = 49$

b Mean $= \frac{49}{7} = 7$

c $7 = \frac{\bar{x}}{10}$ so $\bar{x} = 70$

2 a $7 + 10 + 4 + 10 + 5 + 11 + 2 + 3 = 52$

b Mean $= \frac{52}{8} = 6.5$

c $6.5 = \frac{\bar{x} - 3}{7}$ so $\bar{x} = 48.5$

3 $(1.5 \times 200) + 65 = 365$

4 Standard deviation = 2.34

5 a Mean $= \frac{(1\times 3) + (1.1\times 12) + (1.2\times 40) + (1.3\times 10) + (1.4\times 5)}{70}$ $\frac{84.2}{70}$

$= \frac{84.2}{70}$

$= 1.2$ hours

b $\frac{84.2}{70} = \frac{\bar{x} - 1}{20}$ so $\bar{x} = 25.1$ hours

c Standard deviation of coded data $= \sqrt{\frac{101.82}{70} - \left(\frac{84.2}{70}\right)^2}$

$= 0.0877845...$

Standard deviation = 20 × 0.0877845... = 1.76 hours

6 Standard deviation of coded data $= \sqrt{\frac{176.84}{100} - \left(\frac{131}{100}\right)^2} = 0.229$

Standard deviation $= 0.229 \times 100 = 22.9$

7 Standard deviation of coded data = $= \sqrt{\frac{147.03}{6} - \left(\frac{16.1}{6}\right)^2} = 4.16$

Standard deviation $= \frac{4.16}{0.01} = 416$

8 a $t = 0.8(m + 12)$

8 b Mean of the standardised marks = $\bar{t} = 52.8$

$\bar{t} = 0.8(\bar{m} + 12)$

$\bar{m} = \frac{52.8}{0.8} - 12$

Mean of the original marks = 54

Standard deviation of the standardised marks = $\sqrt{\frac{S_{tt}}{n}} = \sqrt{\frac{7.3}{28}} = 0.5106...$

Standard deviation of the original marks = $\frac{0.5106...}{0.8} = 0.64$

9 Coded mean = 10.15

Mean of the daily mean pressure = 2(10.15 + 500) = 1020.3 hPa

Coded standard deviation = $\sqrt{\frac{S_{cc}}{n}} = \sqrt{\frac{296.4}{30}} = 3.1432...$

Standard deviation of the daily mean pressure = 2 × 3.1432... = 6.28 hPa