| Question | Scheme | Marks | AOs |
|---|---|---|---|
| **1(a)** | $61\times(2\times3),\quad 63\times(2\times12),\quad 65\times(2\times8),\quad 67\times(2\times2)$ | M1 | 2.1 |
| | $\dfrac{61\times(2\times3)+63\times(2\times12)+65\times(2\times8)+67\times(2\times2)}{50}=63.72*$ | A1*cso | 1.1b |
| | | **(2)** | |
| **(b)** | $\sqrt{\dfrac{61^2\times6+63^2\times24+65^2\times16+67^2\times4}{50}-63.72^2}$ | M1 | 1.1b |
| | $=\sqrt{2.5216}=1.58795...$ = awrt **1.59** | A1 | 1.1b |
| | | **(2)** | |
| **(c)** | No effect (oe) since…e.g.<br>• since addition/subtraction does not affect the standard deviation (only multiplication and division do)<br>• the weights will have the same spread<br>• the distance of each weight from the mean will not have changed<br>• they all change by the same amount | B1 | 2.4 |
| | | **(1)** | |
| | | | **(5 marks)** |

| Notes | |
|---|---|
| **(a)** | **M1:** at least 3 correct products seen (oe) Allow any 3 from 366, 1512, 1040, 268<br>**A1*cso:** correct expression for mean (which may be seen in stages) and given answer. $\frac{3186}{50}=63.72$ on its own is M0A0, but $\frac{3186}{50}=63.72$ following all 4 correct products seen can score M1A1 |
| **SC:** | **B2:** $\dfrac{61\times3+63\times12+65\times8+67\times2}{25}=63.72*$ scores M1A1 on epen |
| **(b)** | **M1:** correct expression for the standard deviation including root<br>Allow equivalent complete methods e.g.<br>$\sqrt{\dfrac{6(61-63.72)^2+24(63-63.72)^2+16(65-63.72)^2+4(67-63.72)^2}{50}}$<br>NB: $\sum fx^2 = 203138$<br>**A1:** awrt 1.59 (allow $s$ = awrt 1.60)<br>Correct answer with no incorrect working scores 2 out of 2 |
| **SC:** | **B2:** $\sqrt{\dfrac{61^2\times3+63^2\times12+65^2\times8+67^2\times2}{25}-63.72^2}$ = awrt 1.59 scores M1A1 on epen |
| **(c)** | **B1:** correct statement and correct explanation |