1. (a) (i) $p = 65$ A1   N1

(ii) for evidence of u g sum is 125 (or $99 - p$)   (M1)
   $q = 34$ A1   N2

(b) evidence of median position   (M1)

eg 63rd student, $\dfrac{125}{2}$

median is 17 (sit-ups)   A1   N2

(c) evidence of substituting into $\dfrac{\sum f\,x}{125}$ (M1)

$e.g.$ $\dfrac{15(11)+16(21)+17(33)+18(34)+19(18)+20(8)}{125}$, $\dfrac{2176}{125}$

mean $= 17.4$ A1   N2   **[7]**

2. (a)

Age range	Frequency	Mid - interval value
$0 \le age < 20$	40	10
$20 \le age < 40$	**70**	**30**
$40 \le age < 60$	**100**	**50**
$60 \le age < 80$	**50**	**70**
$80 \le age \le 100$	**10**	**90**

A1A1   N2

(b) For attempting to find $\sum f\,x$ (M1)

Correct substitution   (A1)

eg $40 \times 10 + ... + 10 \times 90 = 11900$

For dividing by 270   (M1)

eg $\dfrac{11900}{270}$

Mean $= 44.1$ A1   N4   **[6]**

3. (a) A = 18, B = 19, C = 23, D = 31, E = 36   A1A1A1A1A1   N5

(b) IQR = 12   A1   N1   **[6]**

4. (a) (i) $m = 165$ A1   N1

(ii) Lower quartile (1st quarter) = 160   (A1)
   Upper quartile (3rd quarter) = 170   (A1)
   IQR = 10   A1   N3

(b) Recognize the need to use the 40th percentile, or 48th student   (M1)
   eg a horizontal line through (0, 48)   N2
   $a = 163$ A1   **[6]**

5. (a) (i) $r = 10$ A2   N2

(ii) $s = 13$ A2   N2

(b) Using $\dfrac{\sum x}{12} = 10$ A1

$t = 18$ A1   N1   **[6]**

6. (a) mean $= \sum \dfrac{x}{n}$ $\left(= \dfrac{2230}{45} \right)$ (M1)

$\bar{x} = 49.6$ (Accept 50)   (A1) (C2)

(b) $\bar{y} = \dfrac{\sum y}{n+2}$ (may be implied)   (M1)

$\sum y = 2230 + 37 + 30$ (A1)

$\bar{y} = \dfrac{2297}{47}$ (A1)

$= 48.9$ (Accept 49)   (A1) (C4)   **[6]**

7. $d = 11$; $c = 11$ (A1)(A1)(C1)(C1)

$d - a = 8$ (or $11 - a = 8$)   (A1)
$a = 3$ (A1) (C2)

$\dfrac{3+b+11+11}{4} = 8$ $\left(\text{or } \dfrac{\text{sum}}{4} = 8\right)$ (A1)

$b = 7$ (A1) (C2)   **[6]**

8. (a) Median = middle number of 75   (M1)
   = 38th number
   = 4   (A1) (C2)

(b) Mean $= \dfrac{5+18+48+72+100+42}{75}$ (M1)

$= \dfrac{285}{75}$
$= 3.8$ (A1) (C2)   **[4]**