Stats 1 — ① Numerical Measures

① a)

Potatoes	6	7	8	9	10	11	12
Freq	2	2	1	4	8	6	4
Cum Freq	2	4	5	9	17	23	27

$$\text{Median} = \frac{27+1}{2} = 14\text{th value} = 10$$

$$LQ = \frac{27+1}{4} = 7\text{th value} = 9$$

$$UQ = \frac{3(27+1)}{4} = 21\text{st value} = 11$$

$$IQR = 11 - 9 = 2$$

b) Do not group the lowest and highest categories.
Record individual data values

② a) (a) 14 15 18 20 25 25 26 27 29 32 34 37 37 (b)

$$\text{Median} = \frac{15+1}{2} = 8\text{th value} = 26$$

$$LQ = \frac{15+1}{4} = 4\text{th value} = 18$$

$$UQ = \frac{3(15+1)}{4} = 12 \text{ value} = 34$$

$$IQR = 34 - 18 = 16$$

b) i) MODE: There is no unique value (25 & 37 are the modal)

ii) SD: We do not know the values of a and b

③

x	f	CF	Midpoint (x)
0-9	5	5	4.5
10-19	16	21	14.5
20	23	44	20
21	27	71	21
22	31	102	22
23	34	136	23
24	16	152	24
25-29	10	162	27
30-34	5	167	32
35-39	3	170	37
40-49	4	174	44.5
50+	1	175	54

a) i)   MODE = 23

ii)   MEDIAN = $\frac{175+1}{2}$ = 88th = 22

LQ = $\frac{175+1}{4}$ = 44th = 20

UQ = $\frac{3(175+1)}{4}$ = 132nd = 23

IQR = 23 - 20 = 3

b) use mid-points for x (see table).

From calculator: $\sum x$ = 3902.5

mean ($\bar{x}$) = 22.3

sample sd (s) = 6.39077....

c) Courrier mean = $\frac{280}{175}$ = 1.6

New mean = 22.3 + 1.6 = 23.9

④ a)   Mean = $\frac{\Sigma x}{n}$ = $\frac{2160}{40}$ = $54°F$

   Sample SD = $\sqrt{\frac{1}{n-1}\left(\Sigma x^2 - \frac{(\Sigma x)^2}{n}\right)}$

   = $\sqrt{\frac{1}{39}\left(116680 - \frac{(2160)^2}{40}\right)}$

   = $\sqrt{\frac{1}{39}(40)}$ = $1.01273...$

b)   Mean = $\frac{5}{9}(54) - \frac{160}{9}$ = $\frac{110}{9}$ or $12\frac{2}{9}$

   SD = $\frac{5}{9}(1.0127...)$ = $0.5626...$