Manganese Analysis Data

Data:

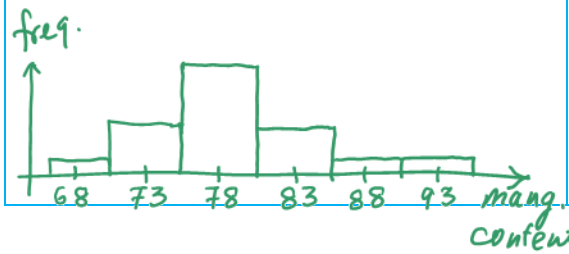
74	79	77	81
68	79	81	76
81	80	80	78
88	83	79	91
79	75	74	73

Stem and Leaf diagram:

6	8
7	3 4 4
7	5 6 7 8 9 9 9 9
8	0 0 1 1 1 3
8	8
9	1

Frequency Table & Histogram

Class	Tally	freq.	r.f	c.r.f
66-70	I	1	0.05	0.05
71-75	IIII	4	0.20	0.25
76-80	IIII IIII	9	0.45	0.70
81-85	IIII	4	0.20	0.90
86-90	I	1	0.05	0.95
91-95	I	1	0.05	1.00



Quantiles

$p = 0.025 \approx 0.03$
$Q(0.03) = -1.88$ from normal quantile table.

i	$p = \frac{i-0.5}{20}$	$Q_{data}(p)$	$Q_{normal}(p)$
1	0.025	68	−1.88
2	0.075	73	−1.41
3	0.125	74	−1.13
4	0.175	74	−0.92
5	0.225	75	−0.77
6	0.275	76	−0.58
7	0.325	77	−0.44
8	0.375	78	−0.31
9	0.425	79	−0.18
10	0.475	79	−0.05
11	0.525	79	+0.08
12	0.575	79	0.20
13	0.625	80	0.33
14	0.675	80	0.47
15	0.725	81	0.61
16	0.775	81	0.77
17	0.825	81	0.95
18	0.875	83	1.18
19	0.925	88	1.48
20	0.975	91	2.05

$Q(0.5) = 0.5\,Q(0.475) + 0.5\,Q(0.525)$
$= (0.5)(79) + (0.5)(79) = 79$

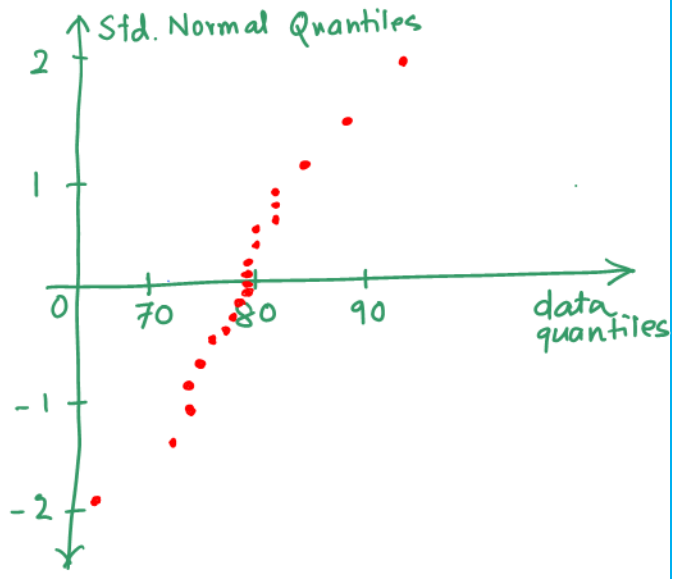
$Q(0.25) = (0.5)\,Q(0.225) + (0.5)\,Q(0.275) = 75.5$

$Q(0.75) = (0.5)\,Q(0.725) + (0.5)\,Q(0.775) = 81$

Alt'ly, $\frac{i-0.5}{20} = 0.75 \rightarrow i = 15.5$

So, $Q(0.75) = (1-0.5)$(15th ordered data) $+ (0.5)$(16th ordered data)
$= 81$

Normal (Quantile) plot:



dot diagram:

Box plot:

$IQR = Q(0.75) - Q(0.25)$
$= 81 - 75.5 = 5.5$

$Q(0.25) - 1.5\,IQR = 67.25$
$Q(0.75) + 1.5\,IQR = 89.25$ (max 91 higher than this)