① Given Data Set =

[3, 8, 3, 4, 3, 6, 4, 8, 9, 1, 3, 5,

10, 1, 2, 3, 4, 5, 2, 8]

First we will Sort the

Data Set,

[1, 1, 2, 2, 3, 3, 3, 3, 3, 4, 4, 4,

5, 5, 6, 8, 8, 8, 9, 10]

Range = Max - Min = 10 - 1 = 9 ✓

Mean = $\frac{\text{Sum of all elements}}{\text{Total elements}}$ = $\frac{92}{20}$ = 4.6 ✓

Median = $\frac{4 + 4}{2}$ = 4 ✓

(Because total elements = even)

Variance $= \dfrac{\Sigma (x_i - \bar{x})^2}{n-1}$

$= (3-4.6)^2 + (8-4.6)^2 + (3-4.6)^2 + (4-4.6)^2$
$+ (3-4.6)^2 + (6-4.6)^2 + (4-4.6)^2 + (8-4.6)^2$
$+ (9-4.6)^2 + (1-4.6)^2 + (3-4.6)^2 + (5-4.6)^2$
$+ (10-4.6)^2 + (1-4.6)^2 + (2-4.6)^2 + (3-4.6)^2$
$\dfrac{+ (4-4.6)^2 + (5-4.6)^2 + (2-4.6)^2 + (8-4.6)^2}{19}$

$= 7.3052$ ✓

Standard deviation $= \sqrt{\text{variance}}$

$= 2.702$ ✓

$$MAD = \frac{1+4+1+0+1+2+0+4+5 + 3+1+1+6+3+2+1+0+1+2+4}{20}$$

$$= 1.5$$

② First for a given data set
we will find frequencies,

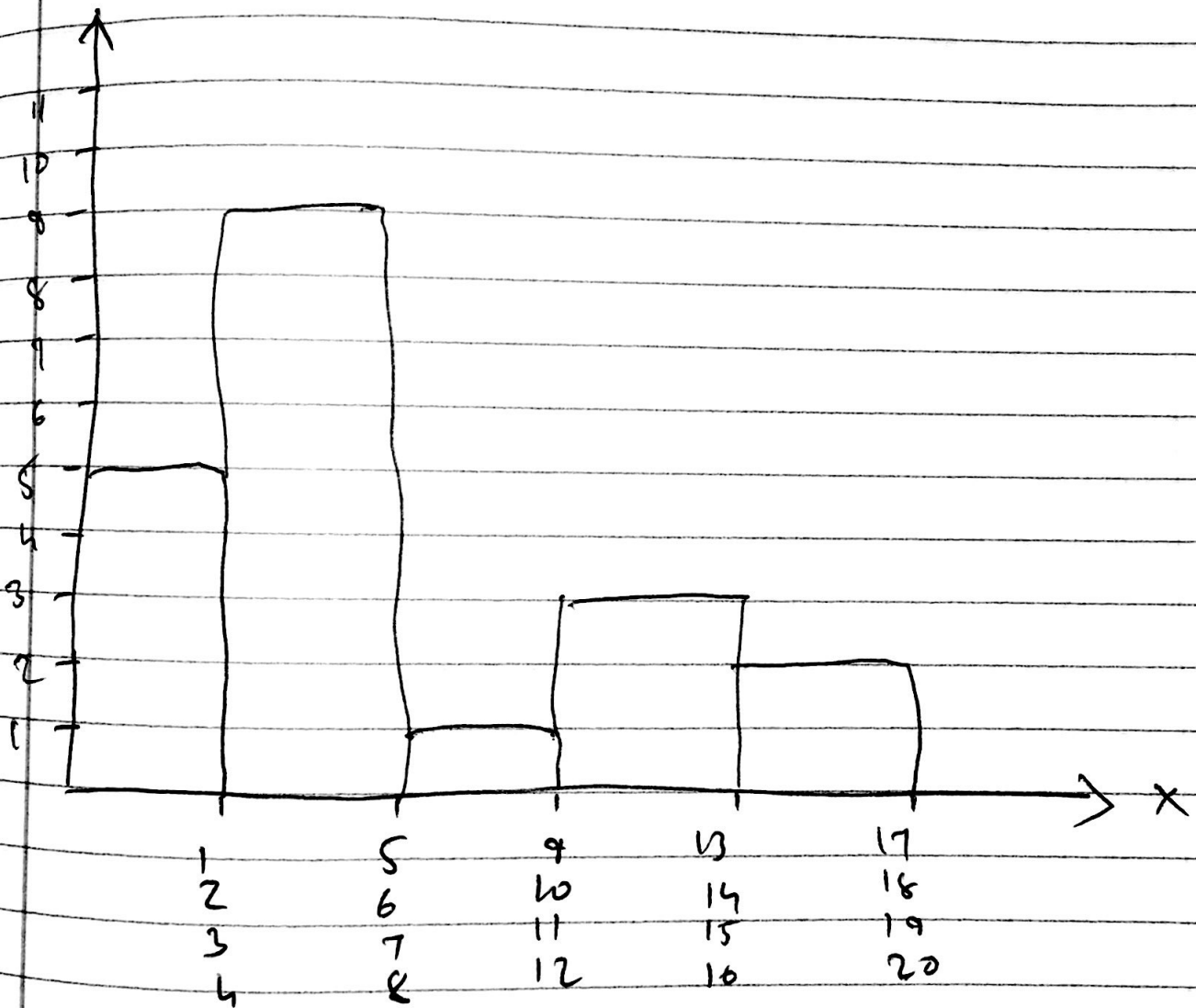| Data	1	20	3	6	7	8	12	15	16	18
Freq.	2	1	3	2	3	4	1	2	1	1

For 10 bins :-
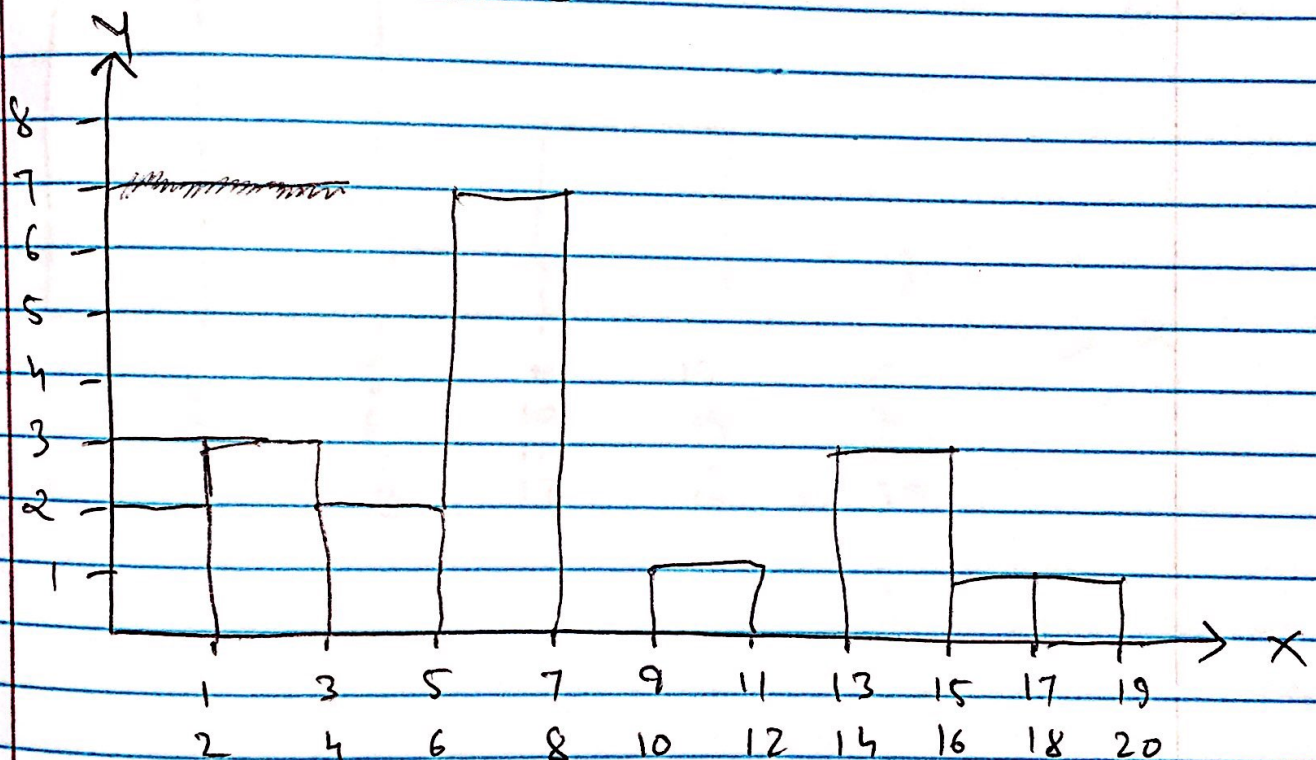
For 5 bins :-

③ Data Set 1 :-

Sorted Data =

1, 1, 3, 3, 3, 6, 6, 7, 7, 7,

8, 8, 8, 8, 12, 15, 15, 16,

18, 20
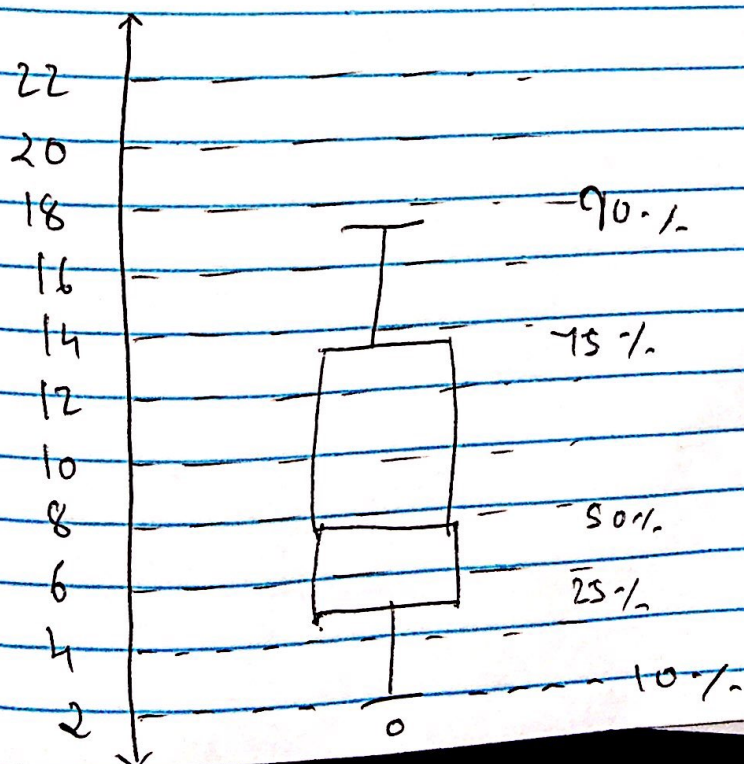
10 percentile :-	1 and 3
25 percentile :-	3 and 6
50 percentile :-	7 and 8
75 percentile :-	12 and 15
90 percentile :-	16 and 18

Data Set 2 :-

Sorted list :-

9, 10, 11, 12, 12, 15, 16, 16, 16,
17, 17, 18, 18, 18, 18, 22, 25

25, 26, 28

10 perentle   -   10 and 11
25 percentle -   12 and 15
50 percentle -   17
75 percentle -   18 and 22
90 percentle -   25 and 26