

BONUS ASSIGNMENT

201-934-DW

OCTOBER 2009

#2.32 (DID NOT HAVE TO DO)

(a) There are $n = 42$ pieces of data

$$\# \text{ of classes} \approx \sqrt{42} = 6.48$$

6 classes

$$\text{Class width} = \frac{\text{range}}{\# \text{ classes}}$$

$$= \frac{5-1}{6} = 0.67 \rightarrow 1$$

Since class width is 1
we should use ungrouped
frequency table

x	f
1	4
2	16
3	10
4	5
5	7

(b) class width is 1

(c) N/A

(d) N/A

(e) N/A

(f) $\bar{x} = 2.88$ $s = 1.25$

2.33

(a) $n=18$ # of classes $\sqrt{18} = 4.24$
4 classes

$$\rightarrow \frac{\text{RANGE}}{\text{\# OF CLASSES}} = \frac{71 - 64}{4} = 1.75$$

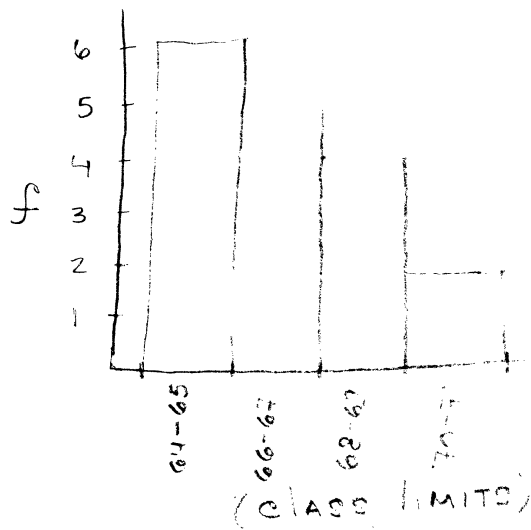
Round up to 2

CLASS LIMITS	f
64 - 65	6
66 - 67	6
68 - 69	4
70 - 71	2

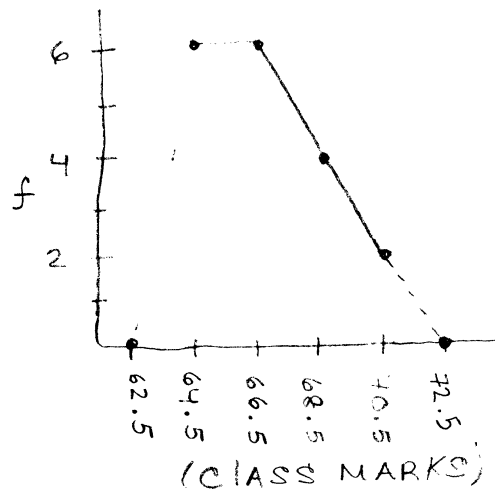
(b) class width is 2
(There are 2 possible data values in each class)

CLASS LIMITS	CLASS bdries	CLASS MARKS
64 - 65	63.5 - 65.5	64.5
66 - 67	65.5 - 67.5	66.5
68 - 69	67.5 - 69.5	68.5
70 - 71	69.5 - 71.5	70.5

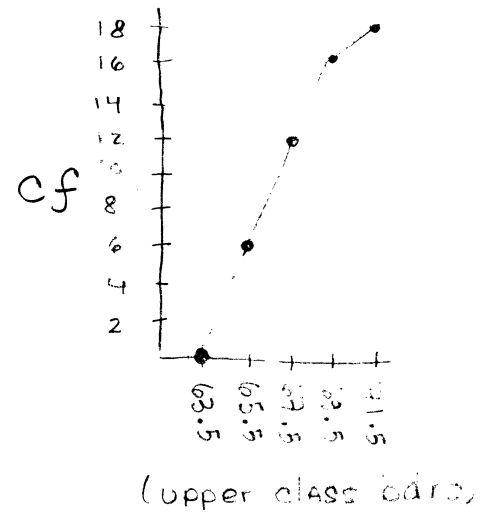
(d) (i) Histogram



(ii) polygon



(iii) cumulative polygon



(e)

MARKS M	f	M · f	M ² f
64.5	6	387	24961.5
66.5	6	399	26533.5
68.5	4	274	18769
70.5	2	141	9940.5
	18	1201	80204.5

$$\bar{x} \approx \frac{1201}{18} = 66.72$$

$$S \approx \sqrt{\frac{80204.5 - \frac{(1201)^2}{18}}{17}} = 2.05$$

(f) Real $\bar{x}$ & S

$$\bar{x} = 66.83$$

$$S = 2.15$$

#2.43

(4)

(a) # of classes $\sqrt{55} = 7.4$; use 7 classes

$$\frac{\text{Range}}{\text{\# classes}} = \frac{52-16}{7} = 5.14 \rightarrow 6$$

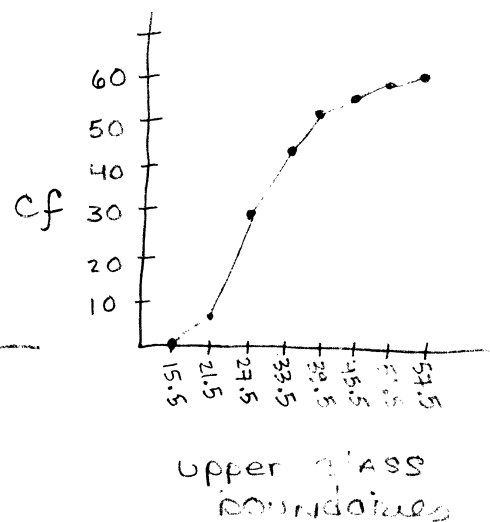
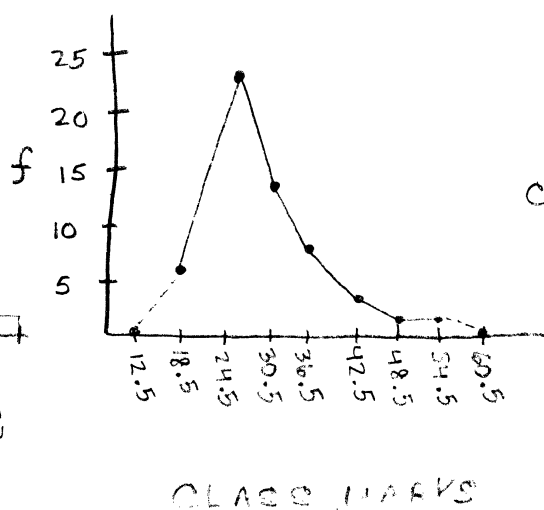
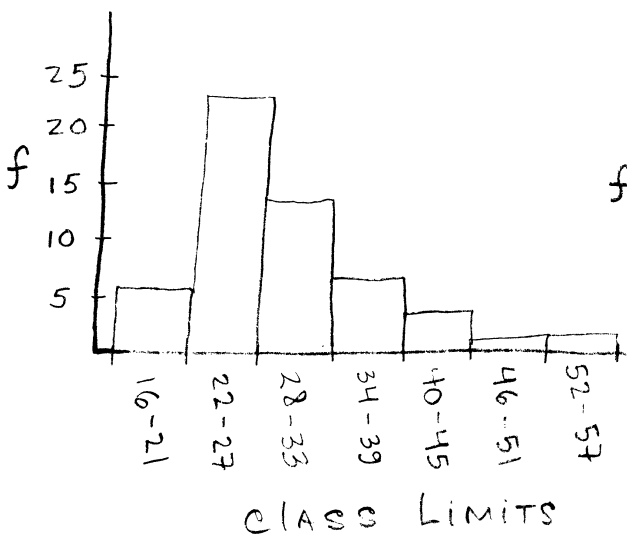
Round Up

CLASS LIMITS	f	CLASS bdrs	CLASS MARKS
16 - 21	6	15.5 - 21.5	18.5
22 - 27	23	21.5 - 27.5	24.5
28 - 33	14	27.5 - 33.5	30.5
34 - 39	7	33.5 - 39.5	36.5
40 - 45	3	39.5 - 45.5	42.5
46 - 51	1	45.5 - 51.5	48.5
52 - 57	1	51.5 - 57.5	54.5

(b) width = 6

(c) see (a)

(d) (i) histogram (ii) polygon (iii) c. polygon



(5)

M	f*	M · f	M ² · f
18.5	6	111	2053.5
24.5	23	563.5	13805.75
30.5	14	427	13023.5
36.5	7	255.5	9325.75
42.5	3	127.5	5418.75
48.5	1	48.5	2352.25
54.5	1	54.5	2970.25
Σ		1587.5	48949.75

* NOTE
I'M
FAIRLY
CERTAIN
I COUNTED
THESE
FREQUENCIES
INCORRECTLY;
YOUR
ANSWERS
COULD BE
SLIGHTLY
DIFFERENT

$$\bar{x} = \frac{1587.5}{55} = 28.86$$

$$s \approx \sqrt{\frac{48949.75 - \frac{(1587.5)^2}{55}}{54}}$$

$$= 6.44$$

Actual $\bar{x} = 28.73$

$$s = 7.84$$

of classes $\sqrt{50} = 7.07$
7 classes

$$\frac{\text{Range}}{\text{\# classes}} = \frac{4.73 - 1.67}{7} = 0.437$$

Round up 0.44

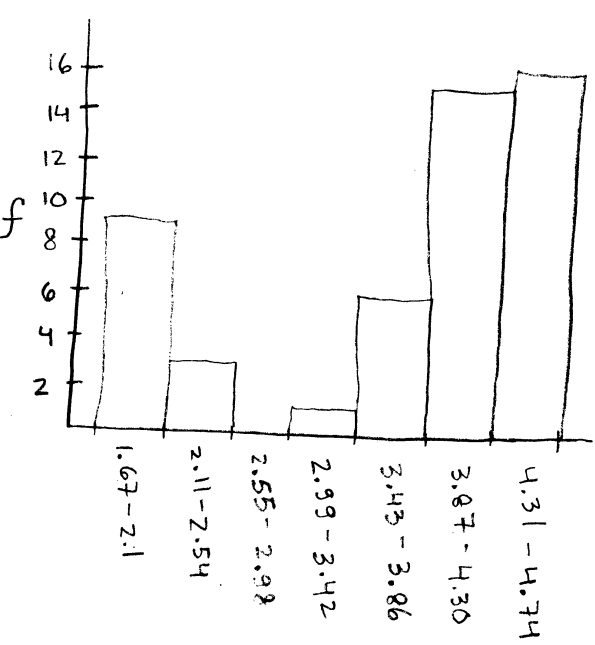
CLASS LIMITS	CLASS bdries	M	f
1.67 - 2.10	1.665 - 2.105	1.885	9
2.11 - 2.54	2.105 - 2.545	2.325	3
2.55 - 2.98	2.545 - 2.985	2.765	0
2.99 - 3.42	2.985 - 3.425	3.205	1
3.43 - 3.86	3.425 - 3.865	3.645	6
3.87 - 4.30	3.865 - 4.305	4.085	15
4.31 - 4.74	4.305 - 4.745	4.525	16

(b) CLASS width is 44
 $\left(\frac{2.10 - 1.67}{0.01} + 1 \right)$

(c) see ABOVE TABLE

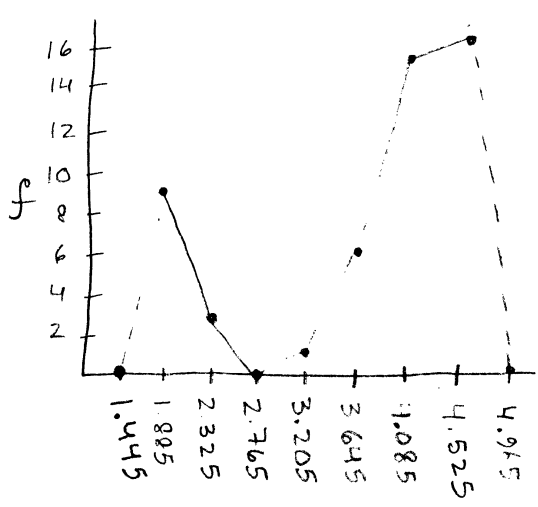
(d)

(i) HISTOGRAM



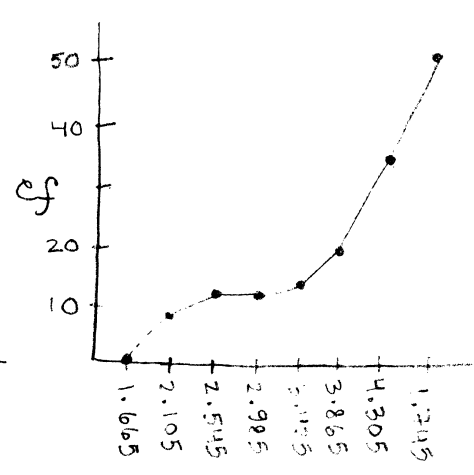
(CLASS LIMITS)

(ii) polygon



CLASS MARKS

(iii) c. polygon



Upper class boundaries

(e)	M	f	Mf	M ² f
	1.885	9	16.965	31.979025
	2.325	3	6.975	16.216875
	2.765	0	0	0
	3.205	1	3.205	10.272025
	3.645	6	21.870	79.71615
	4.085	15	61.275	250.308375
	4.525	16	72.4	327.61
Σ		50	182.69	716.10245

$$\bar{x} \approx \frac{182.69}{50} = 3.6538$$

$$s \approx \sqrt{\frac{716.10245 - \frac{(182.69)^2}{50}}{49}}$$

$$= 0.9958$$

(f) ACTUAL $\bar{x}$ & S

$$\bar{x} = 3.6594$$

$$S = 1.020$$

2.47

OF CLASSES $\sqrt{36} = 6$

6 classes

$$\frac{\text{Range}}{\text{\# OF CLASSES}} = \frac{8.88 - 4.59}{6} = 0.715$$

→ Round up 0.72

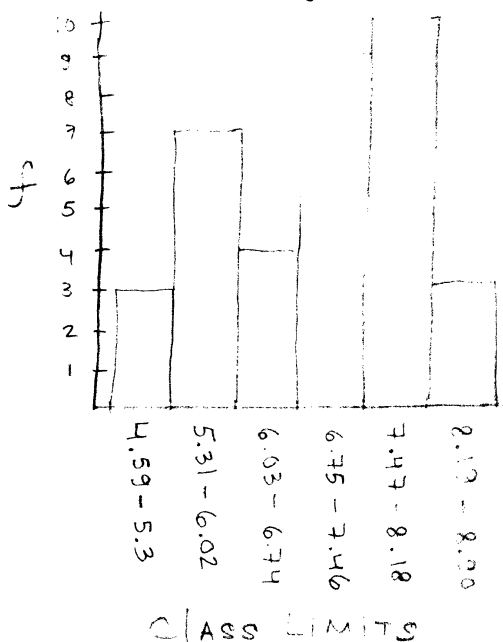
CLASS LIMITS	CLASS bdrs	M	f
4.59 - 5.3	4.585 - 5.305	4.945	3
5.31 - 6.02	5.305 - 6.025	5.665	7
6.03 - 6.74	6.025 - 6.745	6.385	4
6.75 - 7.46	6.745 - 7.465	7.105	9
7.47 - 8.18	7.465 - 8.185	7.825	10
8.19 - 8.90	8.185 - 8.905	8.545	3

(b) class width 72

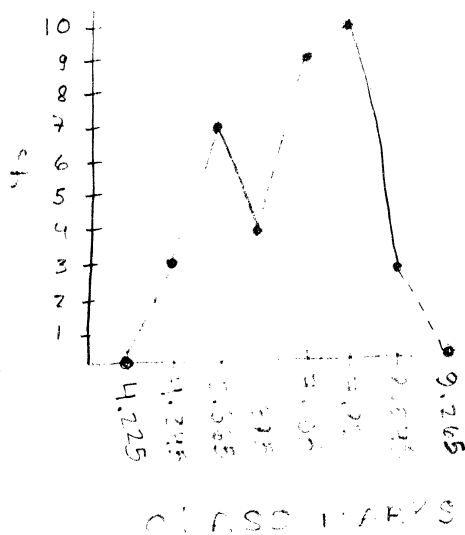
(c) see (a)

(d)

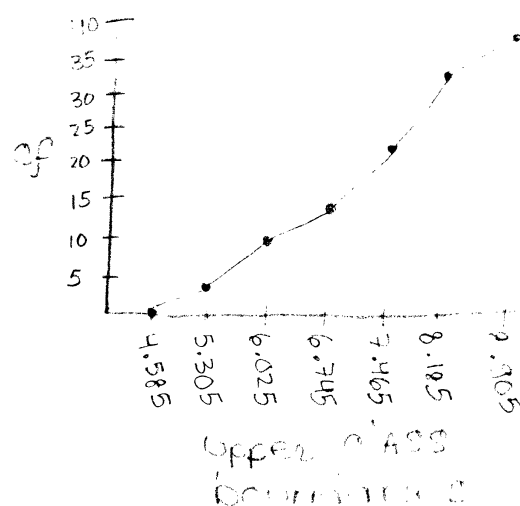
(i) HISTOGRAM



(ii) POLYGON



(iii) C. polygon



M	f	M.f	M ² f
4.945	3	14.835	73.359075
5.665	7	39.655	224.645575
6.385	4	25.54	163.0729
7.105	9	63.945	454.329225
7.825	10	78.25	612.30625
8.545	3	25.635	219.051075
	36	247.86	1746.7641

$$\bar{x} \approx \frac{247.86}{36} = 6.885$$

$$s \approx \sqrt{\frac{1746.7641 - \frac{(247.86)^2}{36}}{35}}$$

$$= 1.0724$$

Actual $\bar{x}$, s

$$\bar{x} = 6.8408$$

$$s = 1.0446$$

2.156

x	f	$x \cdot f$	$x^2 \cdot f$
0	15	0	0
1	12	12	12
2	26	52	104
3	14	42	126
4	4	16	64
6	2	12	72
Σ	73	134	378

$$\bar{x} = \frac{134}{73} = \boxed{1.836}$$

$$S^2 = \text{VARIANCE} = \frac{378 - \frac{134^2}{73}}{72}$$

$$S = \boxed{1.354}$$

2.157

x	f	$x \cdot f$	$x^2 \cdot f$
12.5	2	25	312.5
12.7	6	76.2	967.74
13.0	22	286	3718
13.1	29	379.9	4976.69
13.2	12	158.4	2090.88
13.8	4	55.2	761.76
Σ	75	980.7	12827.57

a.

b.

c.