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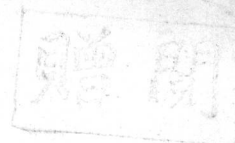
2nd edition

TARO YAMANE

Solutions to
Problems to Accompany
STATISTICS • AN
INTRODUCTORY
ANALYSIS

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2nd edition

TARO YAMANE

Solutions to
Problems to Accompany
**STATISTICS • AN
INTRODUCTORY
ANALYSIS**



Harper & Row, Publishers

New York, Evanston, and London



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SOLUTIONS TO PROBLEMS TO ACCOMPANY STATISTICS, AN
INTRODUCTORY ANALYSIS, 2ND EDITION

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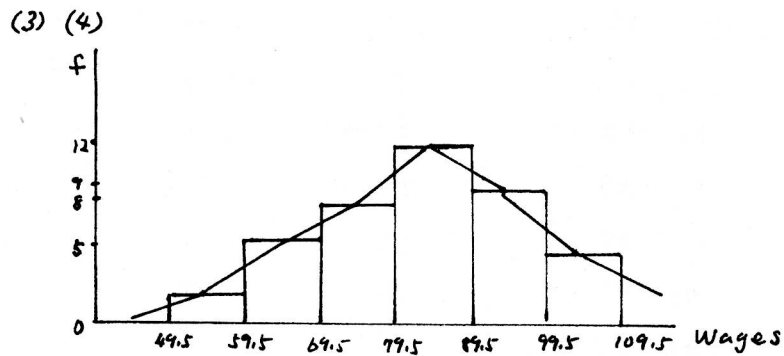
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Chapter 2

2.1

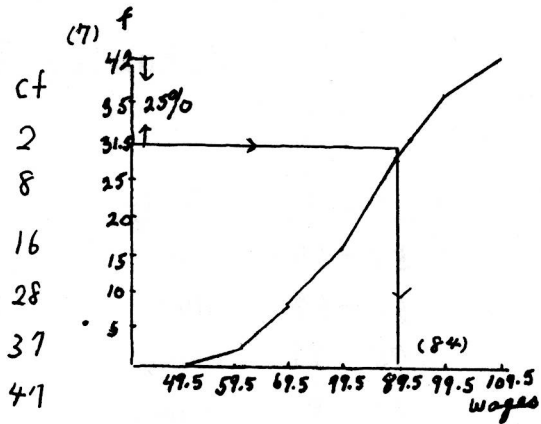
(1) class	Tally	(2) class	f
50-59		50-59	2
60-69	+++	60-69	6
70-79	+++	70-79	8
80-89	+++++	80-89	12
90-99	+++	90-99	9
100-109	+++	100-109	5



(5) The height of a bar shows the frequency density.
The area of a bar shows frequency

(6)

class
50 ~ 59
60 ~ 69
70 ~ 79
80 ~ 89
90 ~ 99
100 ~ 109

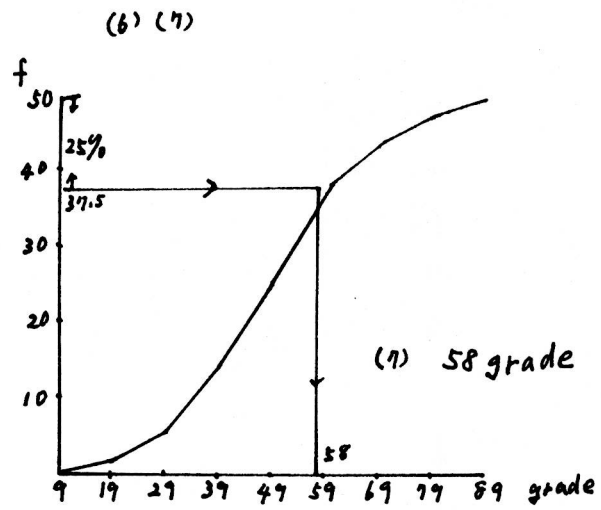


2.2

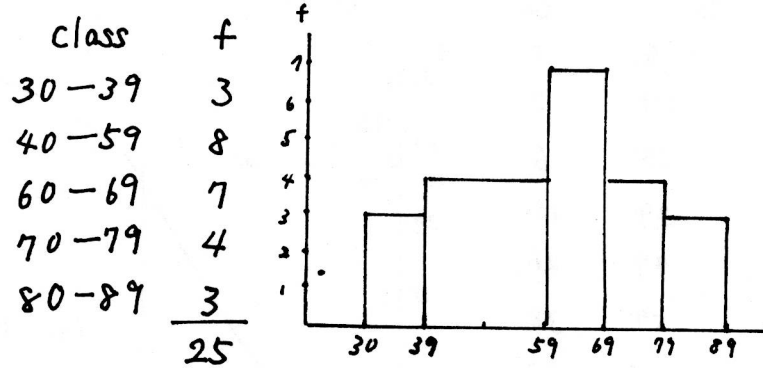
(1) (2) class	tally	f
10-19		2
20-29		4
30-39	+++	9
40-49	+++	11
50-59	+++	12
60-69	+++	6
70-79		4
80-89		2



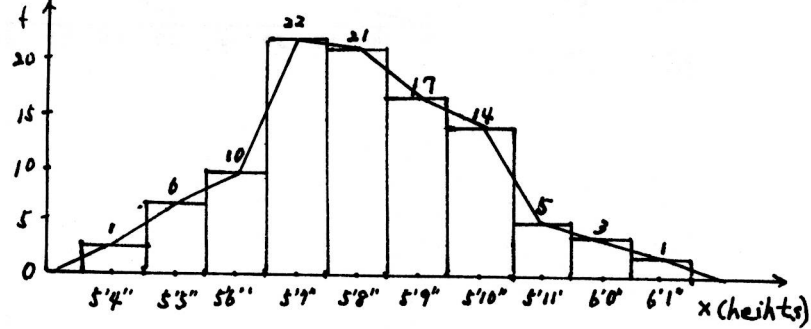
(5)	cf
9	0
19	2
29	6
39	15
49	26
59	38
69	44
79	48
89	50



2.10



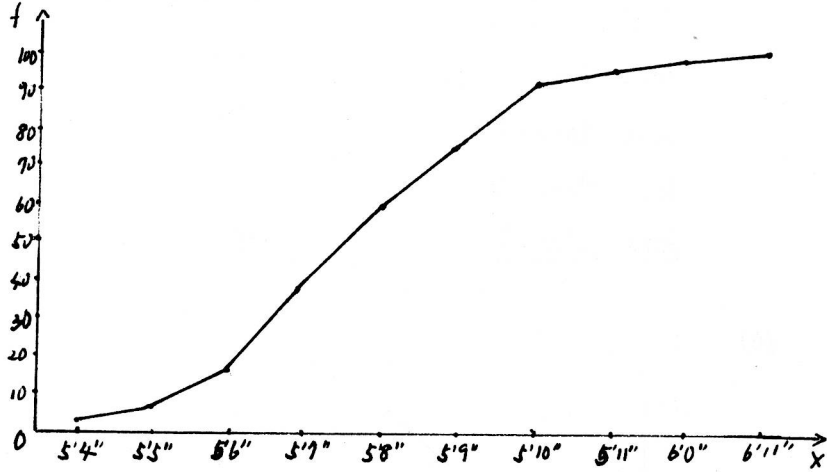
2.11 (1)



(2)

X	Cumulative f
less than 5'4"	1
less than 5'5"	7
less than 5'6"	17
less than 5'7"	39
less than 5'8"	60
less than 5'9"	77
less than 5'10"	91
less than 5'11"	96
less than 6'0"	99
less than 6'1"	100

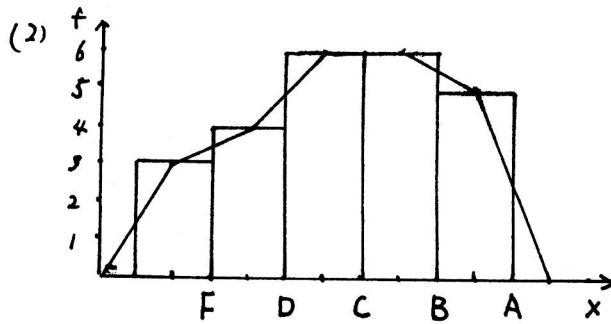
(3)



2.12

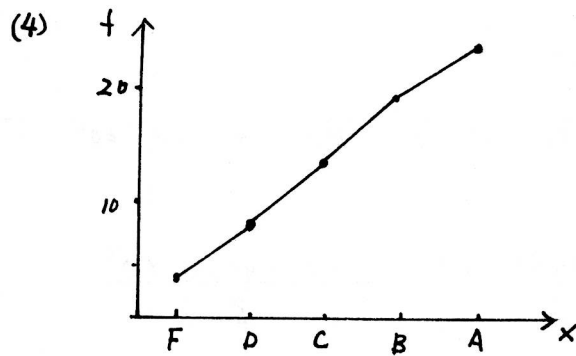
(1)

Grade (x)	Frequency (f)
F	3
D	4
C	6
B	6
A	5



(3)

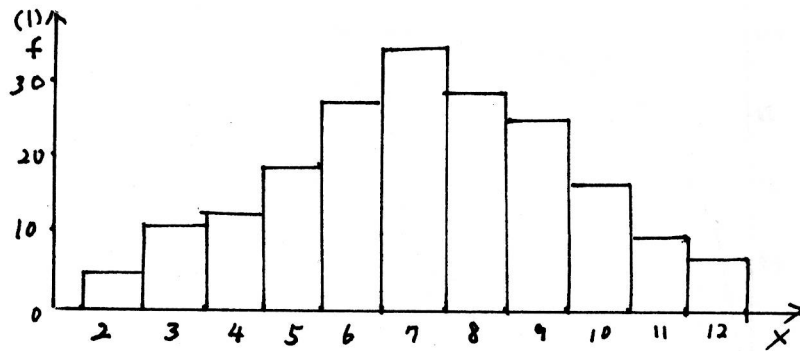
X	Cumulative f
less than F	3
less than D	7
less than C	13
less than B	19
less than A	24



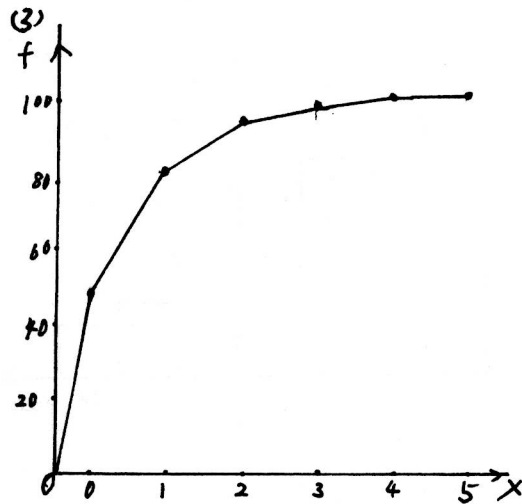
(5)

Grade	Frequency	Relative Frequency
F	3	0.125
D	4	0.167
C	6	0.25
B	6	0.25
A	5	0.207

2.13

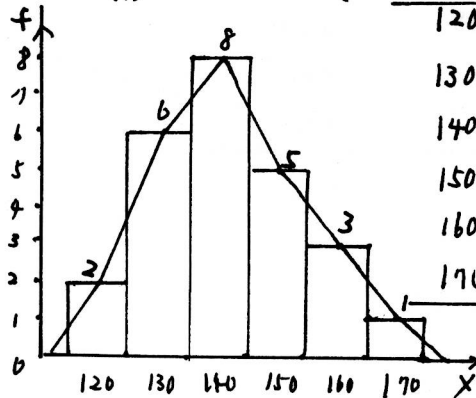


(2)	Outcomes (x)	f	Relative Frequency
	2	5	0.025
	3	11	0.055
	4	13	0.065
	5	19	0.095
	6	28	0.140
	7	35	0.175
	8	29	0.145
	9	25	0.125
	10	18	0.090
	11	10	0.050
	12	7	0.035



(4) x	f	Relative Frequency	(5) x	Cumulative Frequency
0	48	0.48	less than 0	0.48
1	33	0.33	less than 1	0.81
2	14	0.14	less than 2	0.95
3	4	0.04	less than 3	0.99
4	1	0.01	less than 4	1.00
5	0	0.00	less than 5	1.00

2.15 (11)

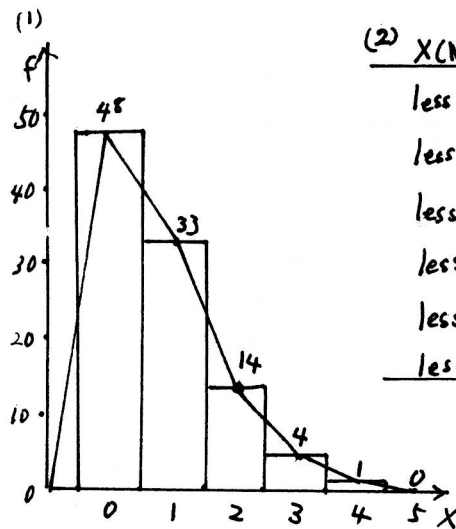


(2) x (weight)	f	Relative Frequency
120	2	0.08
130	6	0.24
140	8	0.32
150	5	0.20
160	3	0.12
170	1	0.04

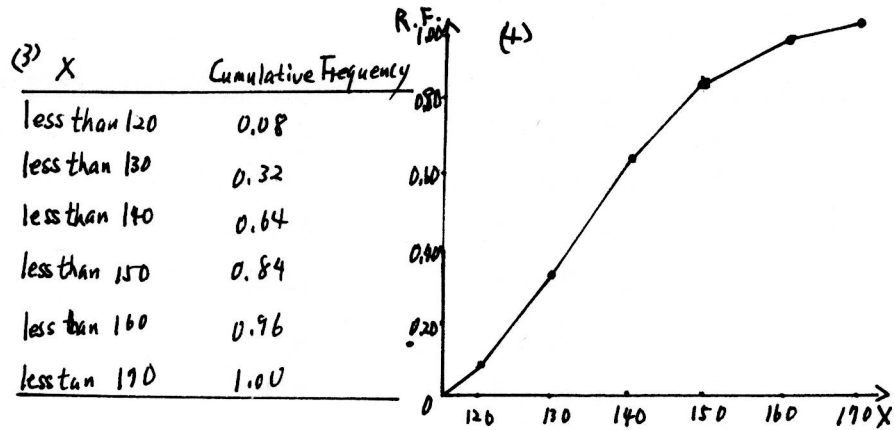
(3) X		Cumulative Relative Frequency
2	less than 2	0.025
3	less than 3	0.080
4	less than 4	0.195
5	less than 5	0.240
6	less than 6	0.380
7	less than 7	0.555
8	less than 8	0.700
9	less than 9	0.825
10	less than 10	0.915
11	less than 11	0.965
12	less than 12	1.000



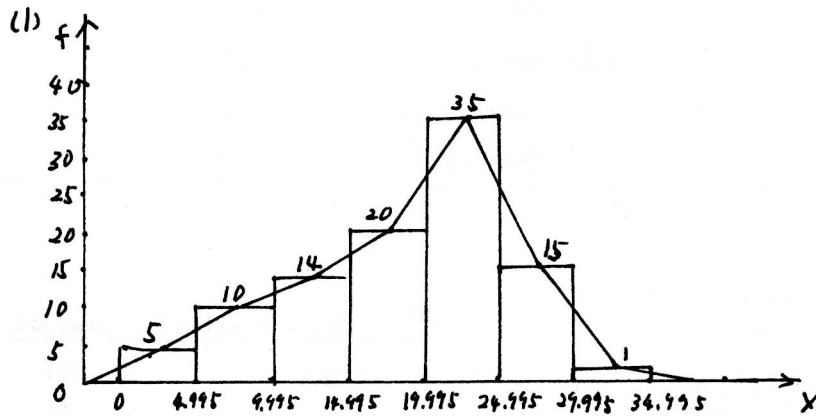
2.14



(2) X (Number of defects)	Cumulative
less than 0	48
less than 1	81
less than 2	95
less than 3	99
less than 4	100
less than 5	100

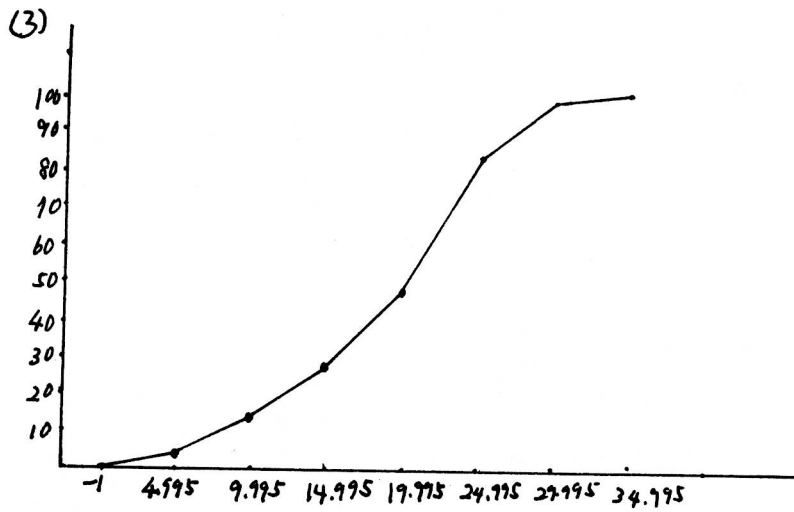


2. 16



(2)

class	f	Less than
0-4.99	5	5
5-9.99	10	15
10-14.99	14	29
15-19.99	20	49
20-24.99	35	84
25-29.99	15	99
30-34.99	1	100



(4)

Class	f	Relative Frequency
0-4.99	5	0.05
5-9.99	10	0.10
10-14.99	14	0.14
15-19.99	20	0.20
20-24.99	35	0.35
25-29.99	15	0.15
30-34.99	1	0.01

Chapter 3

3.1

Let x be the variable wage. Then the mean $\bar{x}$ is $\bar{x} = \frac{1}{42} \sum x_i = \frac{1}{42} \times 3484 = 82.95 \div 83$

3.2

Let x be the variable grade of the examination problem. Then the average grade $\bar{x}$ is $\bar{x} = \frac{1}{50} \sum x_i = \frac{1}{50} \times 2459 = 49.18$

3.3

(1) Class	f	m	f m
50-59	2	54.5	109
60-69	6	64.5	387
70-79	8	74.5	596
80-89	12	84.5	1014
90-99	9	94.5	850.5
100-109	5	104.5	522.5
	42		3479.0

$$\bar{x} = \frac{\sum m f_i}{\sum f_i} = \frac{3479}{42} = 82.6$$

(2)

class	f	m	d	fd
50-59	2		-2	-4
60-69	6		-1	-6
70-79	8	74.5	0	0
80-89	12		1	12
90-99	9		2	18
100-109	5		3	15
	42			35

$$\bar{X} = A + \frac{\sum f_i d_i}{\sum f_i} \times C = 74.5 + \frac{35}{42} \times 10$$

3.4.

(1)

class	f	m	fm
10-19	2	14.5	29.0
20-29	4	24.5	98.2
30-39	9	34.5	310.5
40-49	11	44.5	489.5
50-59	12	54.5	645
60-69	6	64.5	387
70-79	4	74.5	298
80-89	2	84.5	169
	50		2435.2

$$\bar{X} = \frac{\sum m_i f_i}{\sum f_i} = \frac{2435.2}{50} = 48.7$$