

Ungrouped Data

	A	B	C	D	E	F	G
	23	33	46	129	33	321	461
	39	49	78	156	41	319	782
	32	42	64	145	49	231	643
	66	76	132	160	56	265	132
	58	68	116	119	85	541	126
	42	52	84	134	24	442	184
	37	47	74	170	73	358	274
	49	59	98	98	94	149	398
	47	57	94	144	74	333	394
	32	42	64	135	23	301	464
				162	82	329	156
				152	44	149	288
				147		231	
				136		149	
				152		333	
				138		256	
Mean							
Mode							
Median							
Min							
Q1							
Q2							
Q3							
Max							
Range							
Box_Plot							
St. Dev							
Variance							
Est St. Dev							
99%							
99%							
95%							
95%							
68%							
68%							

Answers to Ungrouped Data

	A	B	C	D	E	F	G
	23	33	46	129	33	321	461
	39	49	78	156	41	319	782
	32	42	64	145	49	231	643
	66	76	132	160	56	265	132
	58	68	116	119	85	541	126
	42	52	84	134	24	442	184
	37	47	74	170	73	358	274
	49	59	98	98	94	149	398
	47	57	94	144	74	333	394
	32	42	64	135	23	301	464
				162	82	329	156
				152	44	149	288
				147		231	
				136		149	
				152		333	
				138		256	
Mean	42.50	52.50	85.00	142.31	56.50	294.19	358.50
Mode	32	42	64	152		149	
Median	40.5	50.5	81	144.5	52.5	310	341
Min	23	33	46	98	23	149	126
Q1	32	42	64	134.5	37	231	170
Q2	40.5	50.5	81	144.5	52.5	310	341
Q3	49	59	98	154	78	333	462.5
Max	66	76	132	170	94	541	782
Range	43	43	86	72	71	392	656
Box_Plot							
St. Dev	12.90	12.90	25.81	17.78	24.55	105.19	207.51
Variance	166.50	166.50	666.00	315.96	602.82	11065.10	43061.36
Est St. Dev	10.75	10.75	21.5	18	17.75	98	164
99%	81.21	91.21	162.42	195.64	130.16	609.76	981.04
99%	3.79	13.79	7.58	88.99	-17.16	-21.38	-264.04
95%	68.31	78.31	136.61	177.86	105.60	504.57	773.52
95%	16.69	26.69	33.39	106.76	7.40	83.81	-56.52
68%	55.40	65.40	110.81	160.09	81.05	399.38	566.01
68%	29.60	39.60	59.19	124.54	31.95	189.00	150.99

A.

Grouped Data

Age(Month)	f	m	$f \times m$	$f \times m^2$
1 - 3	5	2		
3 - 5	10		40	
5 - 7	15			540
7 - 9	12	8	96	
9 - 11	6			600
11 - 13	2	12		
	$n = \sum f =$		$\sum (f \times m) =$	$\sum (f \times m^2) =$

Draw the

- Histogram (write your observation)
- Frequency polygon

Compute.

- Mean? (Answ: **6.4**)
- Variance? (Answ **6.69**)
- Standard deviation? (Answ **2.6**)
- Apply all three empirical rules.

$0 < 99.7\% \text{ of data } < 14.2,$ $1.2 < 95\% \text{ of data } < 11.6,$ $3.8 < 68\% \text{ of data } < 9$

B.

Scores	f	m	$f \times m$	$f \times m^2$
00-10	2	5		
10-20	6			1350
20-30	8		200	5000
30-40	14		490	17150
40-50	16			32400
50-60	14	55		
60-70	16		1040	
70-80	12			
80-90	8			
90-100	4			
	$n = \sum f =$		$\sum (f \times m) =$	$\sum (f \times m^2) =$

Draw the

- Histogram (write your observation)
- Frequency polygon

Compute.

- Mean? (Answ **52.80**)
- Variance? (Answ **490.06**)
- Standard deviation? (**22.14**)
- Apply all three empirical rules.

$0 < 99.7\% \text{ of class } < 119.22,$ $8.52 < 95\% \text{ of class } < 97.08,$ $30.66 < 68\% \text{ of class } < 74.94$

C.

Weights	f	m	$f \times m$	$f \times m^2$
25 - 35	1			
35 - 45	3			4800
45 - 55	7		350	
55 - 65	10			
65 - 75	11			
75 - 85	15			
85 - 95	18			
95 - 105	28			280000
105 - 115	32		3520	
	$n = \sum f =$		$\sum (f \times m) =$	$\sum (f \times m^2) =$

Draw the

1. Histogram (write your observation)
2. Frequency polygon

Compute.

- 3 Mean? (*Answ 88.08*)
4. Variance? (*Answ 422.09*)
5. Standard deviation? (*20.54*)
6. Apply all three empirical rules.

D.

Time(sec)	f	m	$f \times m$	$f \times m^2$
6 - 12	100			
12 - 18	60	15		
18 - 24	50			22050
24 - 30	20			
30 - 36	8	33		
36 - 42	6			
42 - 48	4			8100
48 - 54	2		102	
	$n = \sum f =$		$\sum (f \times m) =$	$\sum (f \times m^2) =$

Draw the

1. Histogram (write your observation)
2. Frequency polygon

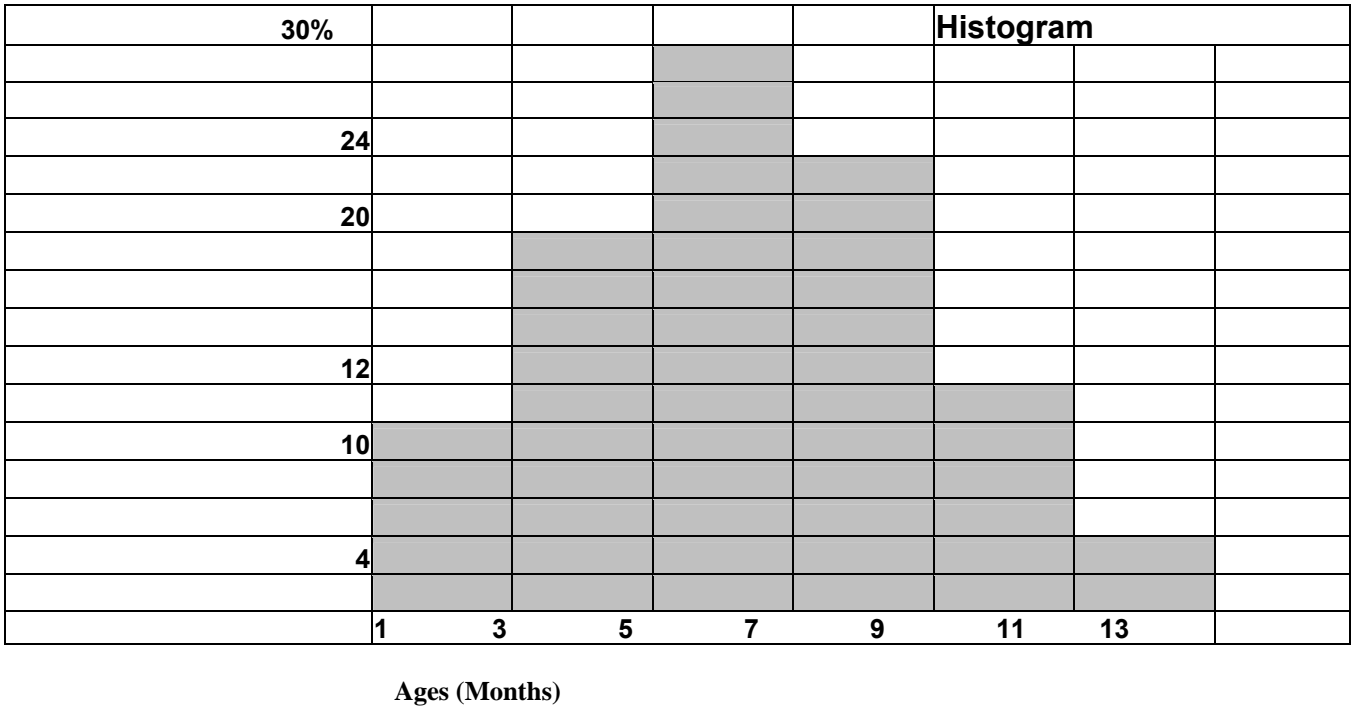
Compute.

3. Mean? (*Answ 16.68*)
4. Variance? (*Answ 79.58*)
5. Standard deviation?(*8.92*)
6. Apply all three empirical rules.

Answer for Group Data(Frequency Table)

Age(Month)	f	m	$f \times m$	$f \times m^2$
1 - 3	5	2	10	20
3 - 5	10	4	40	160
5 - 7	15	6	90	540
7 - 9	12	8	96	768
9 - 11	6	10	60	600
11 - 13	2	12	24	288
	$n = \sum f = 50$		$\sum (f \times m) = 320$	$\sum (f \times m^2) = 2376$

Problem A



3. Mean: $\bar{X} = \frac{\sum (f \times m)}{n} = \frac{320}{50} = 6.4$

4. Variance: $s^2 = \frac{n \sum (f \times m^2) - (\sum (f \times m))^2}{n(n-1)} = \frac{50(2376) - (320)^2}{50(50-1)} = \frac{16400}{2450} = 6.69$

5. Standard deviation = $s = \sqrt{6.69} = 2.59 = 2.6$

6.

Histogram is centered so the results of empirical rules will be valid.

99.7% = $6.4 \pm 3(2.6) = 6.4 \pm 7.8$

$0 < 99.7\% \text{ of data } < 14.2$

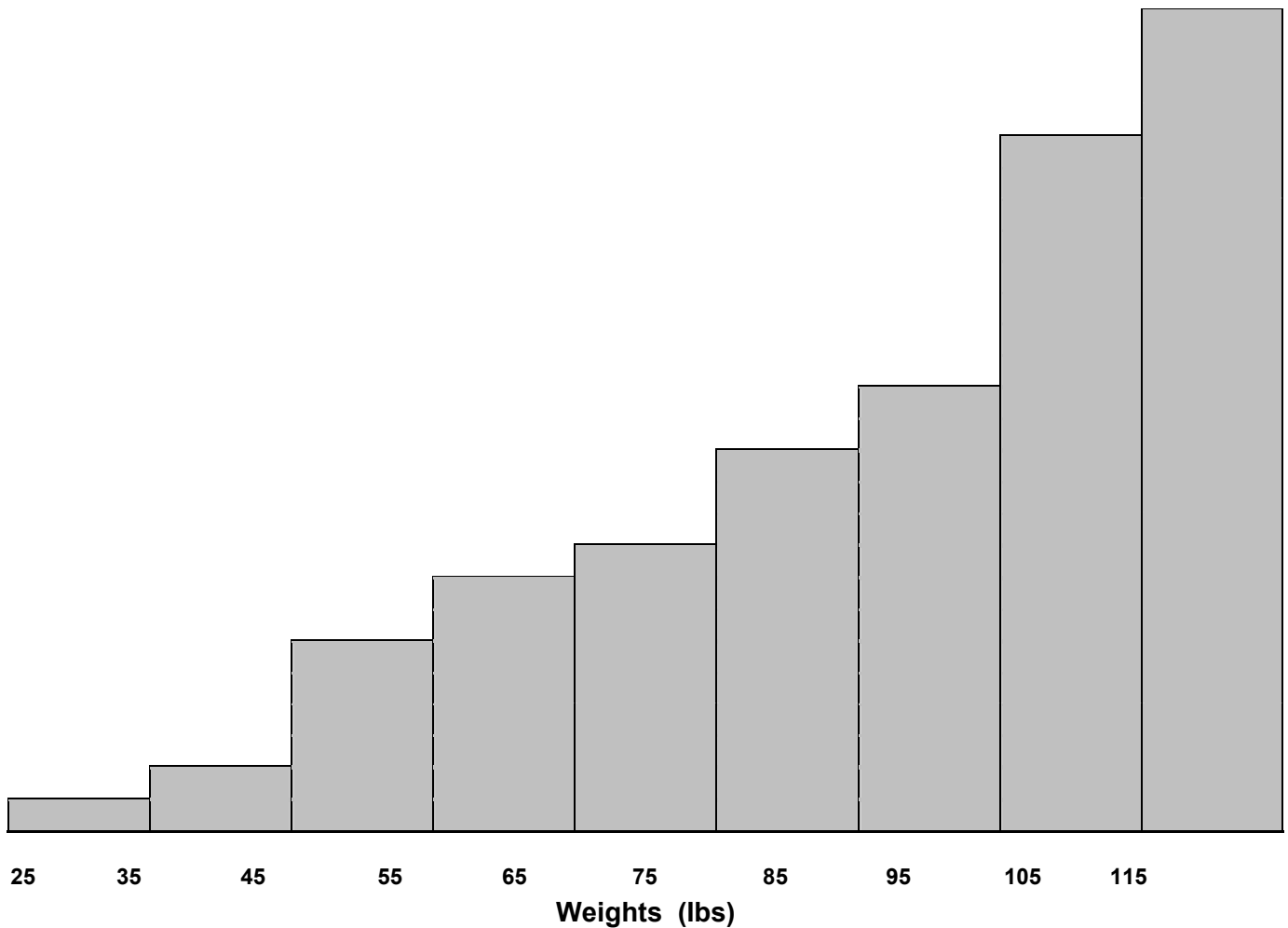
95% = $6.4 \pm 2(2.6) = 6.4 \pm 5.2$

$1.2 < 95\% \text{ of data } < 11.6$

68% = $6.4 \pm 1(2.6) = 6.4 \pm 2.6$

$3.8 < 68\% \text{ of data } < 9$

Problem C				
Weights	f	m	$f \times m$	$f \times m^2$
25 - 35	1	30	30	900
35 - 45	3	40	120	4800
45 - 55	7	50	350	17500
55 - 65	10	60	600	36000
65 - 75	11	70	770	53900
75 - 85	15	80	1200	96000
85 - 95	18	90	1620	145800
95 - 105	28	100	2800	280000
105 - 115	32	110	3520	387200
	$n = \sum f = 125$		$\sum f \times m = 11010$	$\sum f \times m^2 = 1022100$



3. Mean: $\bar{X} = \frac{\sum (f \times m)}{n} = \frac{11010}{125} = 88.08$

$$4. \text{ Variance: } s^2 = \frac{n \sum (f \times m^2) - (\sum (f \times m))^2}{n(n-1)} = \frac{125(1022100) - (11010)^2}{125(125-1)} = \frac{6542400}{15500} = 422.09$$

$$5. \text{ Standard deviation} = s = \sqrt{422.09} = 20.54$$

Histogram is not centered so the results of empirical rules will not be valid.

$$99.7\% = 88.08 \pm 3(20.54) = 88.08 \pm 61.62$$

$$26.46 < 99.7 \% \text{ of weights are between } < 149.7$$

$$95\% = 88.08 \pm 2(20.54) = 88.08 \pm 41.08$$

$$47 < 95 \% \text{ of weights are between } < 129.16$$

$$68\% = 88.08 \pm 1(20.54) = 88.08 \pm 20.54$$

$$67.54 < 68 \% \text{ of weights are between } < 108.62$$

D				
Time(sec)	f	m	$f \times m$	$f \times m^2$
6 - 12	100	9	900	8100
12 - 18	60	15	900	13500
18 - 24	50	21	1050	22050
24 - 30	20	27	540	14580
30 - 36	8	33	264	8712
36 - 42	6	39	234	9126
42 - 48	4	45	180	8100
48 - 54	2	51	102	5202
	$n = \sum f = 250$		$\sum (f \times m) = 4170$	$\sum (f \times m^2) = 89370$

$$3. \text{ Mean: } \bar{X} = \frac{\sum (f \times m)}{n} = \frac{4170}{250} = 16.68$$

$$4. \text{ Variance: } s^2 = \frac{250(89370) - (4170)^2}{250(250-1)} = 79.58$$

$$5. \text{ Standard deviation} = s = \sqrt{79.58} = 8.92$$

Histogram is not centered so the results of empirical rules will not be valid.

$$99.7\% = 16.68 \pm 3(8.92) = 16.68 \pm 26.76$$

$$0 < 99.7 \% \text{ of Times are between } < 43.44$$

$$95\% = 16.68 \pm 2(8.92) = 16.68 \pm 17.84$$

$$0 < 95 \% \text{ of Times are between } < 34.52$$

$$68\% = 16.68 \pm 1(8.92) = 16.68 \pm 8.92$$

$$7.76 < 68 \% \text{ of Times are between } < 25.6$$