Statistics Assignment, S1 2001

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Question 1

a) –1.05 to 0.55

X	AREA
-1.05	0.011494107
-0.95	0.025405906
-0.85	0.027798489
-0.75	0.030113743
-0.65	0.032297236
-0.55	0.034294386
-0.45	0.036052696
-0.35	0.037524035
-0.25	0.038666812
-0.15	0.039447933
-0.05	0.039844391
0.05	0.039844391
0.15	0.039447933
0.25	0.038666812
0.35	0.037524035
0.45	0.036052696
0.55	0.017147193
The value for the area using the mid-ordinate method	0.561622793
The value for the area using the Z tables	0.5619
Difference	0.000277207
% Difference	0.049358224

b) 0.15 to 1.75

X	AREA
0.15	0.019723967
0.25	0.038666812
0.35	0.037524035
0.45	0.036052696
0.55	0.034294386
0.65	0.032297236
0.75	0.030113743
0.85	0.027798489
0.95	0.025405906
1.05	0.022988214
1.15	0.020593627
1.25	0.018264909

1.35		0.016038333
1.45		0.013943057
1.55		0.0120009
1.65		0.010226492
1.75		0.004313866
	The value for the area using the mid-ordinate method	0.400246665
	The value for the area using the Z tables	0.4003
	Difference	0.00005333
	% Difference	0.013325424

c) –1.55 to 0.05

	X	AREA
-1.55		0.00600045
-1.45		0.013943057
-1.35		0.016038333
-1.25		0.018264909
-1.15		0.020593627
-1.05		0.022988214
-0.95		0.025405906
-0.85		0.027798489
-0.75		0.030113743
-0.65		0.032297236
-0.55		0.034294386
-0.45		0.036052696
-0.35		0.037524035
-0.25		0.038666812
-0.15		0.039447933
-0.05		0.039844391
0.05		0.019922196
	The value for the area using the mid-ordinate method	0.459196411
	The value for the area using the Z tables	0.4593
	Difference	0.000103589
	% Difference	0.02255883

Question 2

a)

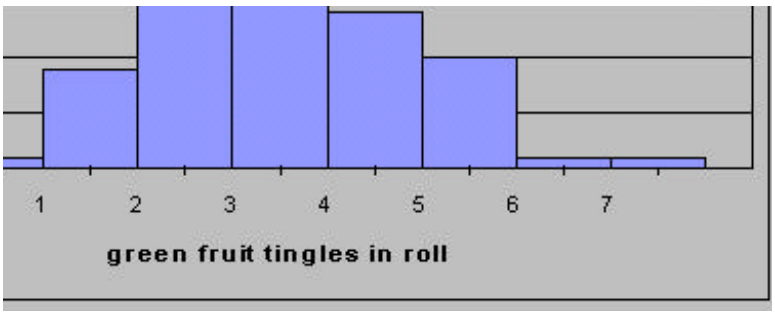
The class set of data for number of green fruit tingles in a roll

3	3	3	3	3
4	4	1	5	3
4	3	5	1	4
7	1	2	4	4
2	3	2	1	1
2	2	3	4	1
3	4	5	6	5
4	5	2	2	5
4	5	2	2	5
3	2	2	4	5
3	3	2	3	2
3	4	2	3	2
3	2	1	3	4
2	3	5	2	2
2	1	2	3	3
0	1	2	3	4

b)

Frequency distribution table for number of green fruit tingles in a roll

x	f	fx	$(x-u)^2$
0	1	0	8.850625
1	9	9	3.900625
2	22	44	0.950625
3	22	66	0.000625
4	14	56	1.050625
5	10	50	4.100625
6	1	6	9.150625
7	1	7	16.200625
	80	238	44.205



c)

class	class center	f	fx	$(x-u)^2$
1.6 - 2	1.8	2	3.6	1.485352
2.1 - 2.5	2.3	2	4.6	0.516602
2.6 - 3	2.8	5	14	0.047852
3.1 - 3.5	3.3	3	9.9	0.079102
3.6 - 4	3.8	3	11.4	0.610352
4.1 - 4.5	4.3	0	0	1.641602
4.6 - 5	4.8	1	4.8	3.172852
	23.1	16	48.3	7.553711

d)
Frequency distribution table for population of fruit tingles

x	f	fx	$(x-u)^2$
0	1	0	8.850625
1	9	9	3.900625
2	22	44	0.950625
3	22	66	0.000625
4	14	56	1.050625
5	10	50	4.100625
6	1	6	9.150625
7	1	7	16.200625
Σ	80	238	44.205

μ = 2.975

standard deviation = 0.43097

To find mean

$$m = \frac{\Sigma(fx)}{\Sigma(f)}$$

$$m = \frac{238}{80}$$

$$m = 2.95$$

To find standard deviation

$$s = \sqrt{\frac{\Sigma(x-m)^2}{n}}$$

$$s = \sqrt{\frac{44.205}{238}}$$

$$s = \sqrt{0.1857}$$

$$s = 0.4309$$

e)

class	class center	f	fx	$(x-u)^2$
1.6 - 2	1.8	2	3.6	1.485352
2.1 - 2.5	2.3	2	4.6	0.516602
2.6 - 3	2.8	5	14	0.047852
3.1 - 3.5	3.3	3	9.9	0.079102
3.6 - 4	3.8	3	11.4	0.610352
4.1 - 4.5	4.3	0	0	1.641602
4.6 - 5	4.8	1	4.8	3.172852
	23.1	16	48.3	7.553711

μ = 3.01875

standard deviation = 0.39544

To find mean

$$m = \frac{\Sigma(fx)}{\Sigma(f)}$$

$$m = \frac{43.8}{16}$$

$$m = 3.018$$

To find standard deviation

$$s = \sqrt{\frac{\Sigma(x-m)^2}{n}}$$

$$s = \sqrt{\frac{7.553}{48.3}}$$

$$s = \sqrt{0.15637}$$

$$s = 0.3954$$

f) There is a relation because one is the stats for the whole population and one is the stats for the mean of the samples the population was made up of.