

Anexo 6

Análisis de piezas de fallo único.

Máquina 1

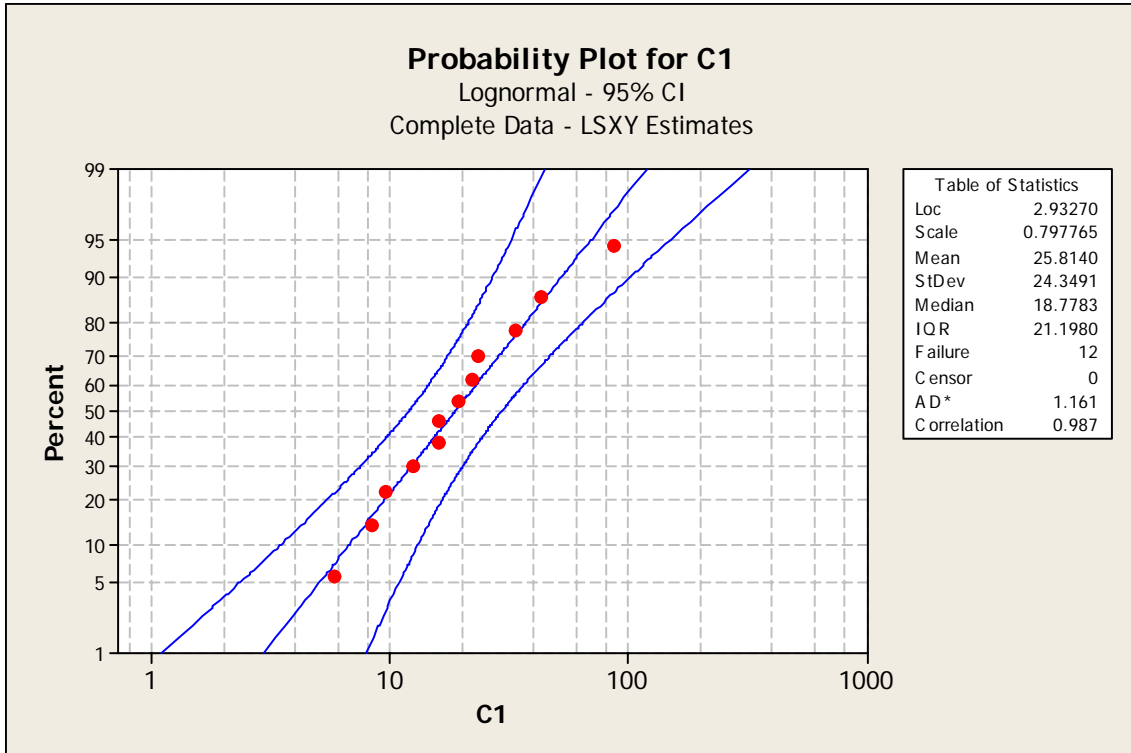


Figura 1 Gráfica de probabilidad de piezas de fallo único en máquina 1

Censoring Information Count
Uncensored value 12

Estimation Method: Least Squares (failure time(X) on rank(Y))

Distribution: Lognormal

Parameter Estimates

Parameter	Estimate	Standard Error	95.0% Normal CI	
			Lower	Upper
Location	2.93270	0.230295	2.48133	3.38407
Scale	0.797765	0.193717	0.495659	1.28401

Log-Likelihood = -48.335

Goodness-of-Fit
Anderson-Darling (adjusted) = 1.161
Correlation Coefficient = 0.987

Characteristics of Distribution

	Estimate	Standard Error	95.0% Normal CI	
			Lower	Upper
Mean(MTTF)	25.8140	7.15930	14.9893	44.4559

Standard Deviation	24.3491	13.0241	8.53458	69.4676
Median	18.7783	4.32455	11.9572	29.4906
First Quartile(Q1)	10.9640	2.90304	6.52514	18.4225
Third Quartile(Q3)	32.1621	8.51582	19.1410	54.0410
Interquartile Range(IQR)	21.1980	7.45543	10.6396	42.2344

Table of Percentiles

Percent	Percentile	Standard Error	95.0% Normal CI	
			Lower	Upper
1	2.93534	1.48554	1.08862	7.91480
2	3.64842	1.67715	1.48189	8.98246
3	4.18820	1.80521	1.79946	9.74797
4	4.64628	1.90469	2.08049	10.3764
5	5.05560	1.98759	2.33951	10.9250
6	5.43228	2.05960	2.58379	11.4211
7	5.78558	2.12392	2.81752	11.8803
8	6.12137	2.18251	3.04342	12.3122
9	6.44365	2.23673	3.26333	12.7234
10	6.75529	2.28752	3.47860	13.1185
20	9.59543	2.70748	5.51933	16.6818
30	12.3586	3.11073	7.54604	20.2405
40	15.3420	3.61251	9.67056	24.3394
50	18.7783	4.32455	11.9572	29.4906
60	22.9844	5.41204	14.4878	36.4638
70	28.5327	7.18182	17.4217	46.7299
80	36.7493	10.3693	21.1383	63.8892
90	52.1999	17.6762	26.8801	101.370
91	54.7244	18.9960	27.7147	108.057
92	57.6056	20.5387	28.6403	115.865
93	60.9490	22.3747	29.6815	125.155
94	64.9129	24.6112	30.8749	136.476
95	69.7495	27.4218	32.2771	150.726
96	75.8941	31.1119	33.9835	169.492
97	84.1949	36.2898	36.1742	195.962
98	96.6515	44.4299	39.2571	237.957
99	120.131	60.7965	44.5526	323.918

Máquina 2

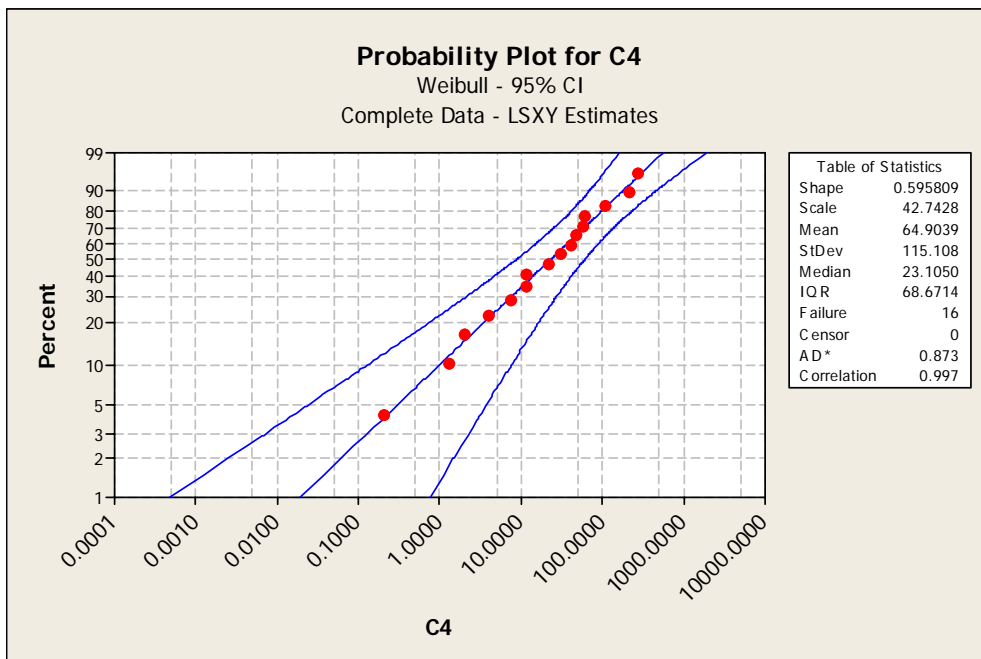


Figura 2 Gráfica de probabilidad de piezas de fallo único en máquina 2

Variable: C4

Censoring Information Count
Uncensored value 16

Estimation Method: Least Squares (failure time(X) on rank(Y))

Distribution: Weibull

Parameter Estimates

Parameter	Estimate	Standard Error	95.0% Normal CI	
			Lower	Upper
Shape	0.595809	0.133574	0.383953	0.924564
Scale	42.7428	18.8904	17.9751	101.638

Log-Likelihood = -77.765

Goodness-of-Fit
Anderson-Darling (adjusted) = 0.873
Correlation Coefficient = 0.997

Characteristics of Distribution

	Estimate	Standard Error	95.0% Normal CI	
			Lower	Upper
Mean(MTTF)	64.9039	30.6012	25.7598	163.531
Standard Deviation	115.108	73.6646	32.8375	403.498
Median	23.1050	11.3808	8.79894	60.6711
First Quartile(Q1)	5.28090	3.77589	1.30044	21.4449
Third Quartile(Q3)	73.9523	31.8274	31.8137	171.905
Interquartile Range(IQR)	68.6714	29.8660	29.2805	161.055

Table of Percentiles

Percent	Percentile	Standard Error	95.0% Normal CI	
			Lower	Upper
1	0.0189559	0.0356975	0.0004729	0.759829
2	0.0611900	0.0996485	0.0025147	1.48891
3	0.121886	0.180398	0.0067007	2.21709
4	0.199252	0.273971	0.0134586	2.94988
5	0.292309	0.378151	0.0231564	3.68990
6	0.400461	0.491496	0.0361291	4.43877
7	0.523332	0.612990	0.0526921	5.19767
8	0.660692	0.741878	0.0731478	5.96756
9	0.812413	0.877580	0.0977908	6.74926
10	0.978444	1.01964	0.126911	7.54350
20	3.44774	2.73569	0.727992	16.3283
30	7.57534	4.94056	2.10988	27.1987
40	13.8430	7.72041	4.63988	41.3005
50	23.1050	11.3808	8.79894	60.6711
60	36.9097	16.6360	15.2575	89.2887
70	58.3672	25.1642	25.0718	135.879
80	95.0042	41.4839	40.3704	223.575
90	173.301	83.0134	67.7744	443.137
91	186.816	90.9183	71.9711	484.921
92	202.406	100.262	76.6623	534.401
93	220.687	111.505	81.9782	594.095
94	242.578	125.344	88.1092	667.853
95	269.538	142.906	95.3504	761.936
96	304.080	166.165	104.195	887.418
97	351.063	199.018	115.568	1066.43
98	421.835	250.807	131.538	1352.80

Máquina 3

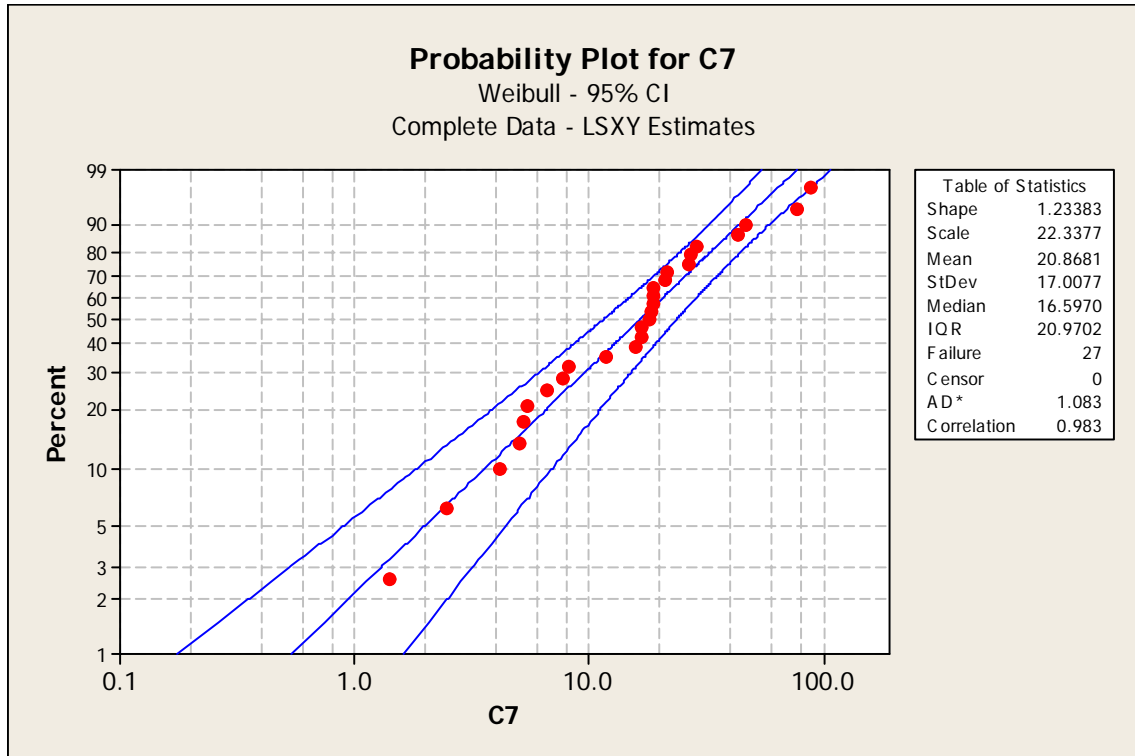


Figura 3 Gráfica de probabilidad de piezas de fallo único en máquina 3

Variable: C7

Censoring Information Count
Uncensored value 27

Estimation Method: Least Squares (failure time(X) on rank(Y))

Distribution: Weibull

Parameter Estimates

Parameter	Estimate	Standard Error	95.0% Normal CI	
			Lower	Upper
Shape	1.23383	0.158566	0.959099	1.58726
Scale	22.3377	3.70280	16.1413	30.9127

Log-Likelihood = -109.777

Goodness-of-Fit

Anderson-Darling (adjusted) = 1.083

Correlation Coefficient = 0.983

Characteristics of Distribution

	Estimate	Standard Error	95.0% Normal CI	
			Lower	Upper
Mean(MTTF)	20.8681	3.24997	15.3786	28.3170
Standard Deviation	17.0077	2.94519	12.1128	23.8807
Median	16.5970	3.06642	11.5548	23.8394

First Quartile(Q1)	8.13760	2.02617	4.99524	13.2567
Third Quartile(Q3)	29.1078	4.50947	21.4852	39.4349
Interquartile Range(IQR)	20.9702	3.22888	15.5074	28.3574

Table of Percentiles

Percent	Percentile	Standard Error	95.0% Normal CI	
			Lower	Upper
1	0.536834	0.304782	0.176433	1.63343
2	0.945370	0.470808	0.356197	2.50907
3	1.31862	0.603202	0.537942	3.23222
4	1.67183	0.716847	0.721462	3.87410
5	2.01171	0.817978	0.906688	4.46345
6	2.34199	0.909956	1.09360	5.01546
7	2.66505	0.994854	1.28219	5.53931
8	2.98253	1.07406	1.47248	6.04112
9	3.29562	1.14858	1.66449	6.52521
10	3.60525	1.21913	1.85823	6.99475
20	6.62334	1.79158	3.89790	11.2544
30	9.68641	2.24331	6.15220	15.2509
40	12.9598	2.65292	8.67669	19.3572
50	16.5970	3.06642	11.5548	23.8394
60	20.8098	3.53160	14.9214	29.0217
70	25.9643	4.12318	19.0197	35.4445
80	32.8507	5.00184	24.3748	44.2739
90	43.9145	6.68763	32.5822	59.1882
91	45.5362	6.96393	33.7428	61.4515
92	47.3332	7.27853	35.0166	63.9819
93	49.3514	7.64223	36.4324	66.8515
94	51.6576	8.07088	38.0315	70.1656
95	54.3545	8.58932	39.8773	74.0877
96	57.6134	9.23949	42.0742	78.8917
97	61.7526	10.1008	44.8151	85.0914
98	67.4791	11.3540	48.5229	93.8409
99	77.0172	13.5851	54.5059	108.826

Máquina 4

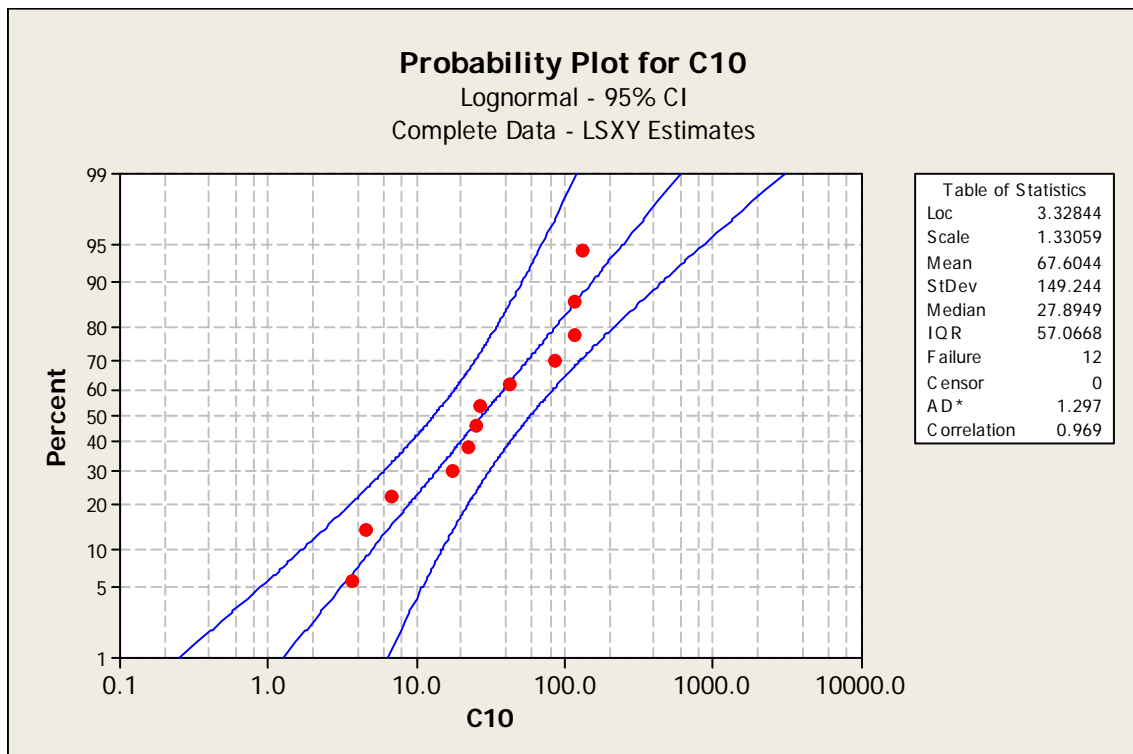


Figura 4 Gráfica de probabilidad de piezas de fallo único en máquina 4

Variable: C10

Censoring Information Count
 Uncensored value 12

Estimation Method: Least Squares (failure time(X) on rank(Y))

Distribution: Lognormal

Parameter Estimates

Parameter	Estimate	Standard Error	95.0% Normal CI	
			Lower	Upper
Location	3.32844	0.384107	2.57561	4.08128
Scale	1.33059	0.313388	0.838614	2.11117

Log-Likelihood = -59.400

Goodness-of-Fit
 Anderson-Darling (adjusted) = 1.297
 Correlation Coefficient = 0.969

Characteristics of Distribution

	Estimate	Standard Error	95.0% Normal CI	
			Lower	Upper
Mean(MTTF)	67.6044	38.3275	22.2534	205.378
Standard Deviation	149.244	148.728	21.1660	1052.34
Median	27.8949	10.7146	13.1393	59.2212
First Quartile(Q1)	11.3700	4.98492	4.81471	26.8504
Third Quartile(Q3)	68.4368	30.0045	28.9801	161.614
Interquartile Range(IQR)	57.0668	27.6595	22.0707	147.554

Table of Percentiles

Percent	Percentile	Standard Error	95.0% Normal CI	
			Lower	Upper
1	1.26243	1.04030	0.251060	6.34801
2	1.81440	1.35994	0.417578	7.88369
3	2.28391	1.60679	0.575220	9.06825
4	2.71558	1.81873	0.730771	10.0913
5	3.12622	2.00969	0.886800	11.0208
6	3.52431	2.18663	1.04461	11.8904
7	3.91485	2.35361	1.20496	12.7191
8	4.30112	2.51324	1.36838	13.5194
9	4.68542	2.66734	1.53522	14.2997
10	5.06944	2.81726	1.70576	15.0661
20	9.10292	4.24146	3.65231	22.6879
30	13.8833	5.80025	6.12168	31.4857
40	19.9124	7.81019	9.23124	42.9525
50	27.8949	10.7146	13.1393	59.2212
60	39.0774	15.3272	18.1160	84.2926
70	56.0477	23.4160	24.7137	127.110
80	85.4809	39.8294	34.2970	213.050
90	153.493	85.3014	51.6474	456.174
91	166.074	94.5436	54.4157	506.849
92	180.912	105.711	57.5562	568.647
93	198.762	119.496	61.1776	645.767
94	220.788	136.986	65.4416	744.898
95	248.903	160.007	70.6049	877.454
96	286.541	191.907	77.1089	1064.80
97	340.699	239.692	85.8077	1352.75

98	428.861	321.441	98.7007	1863.43
99	616.370	507.918	122.578	3099.36

Máquina 5

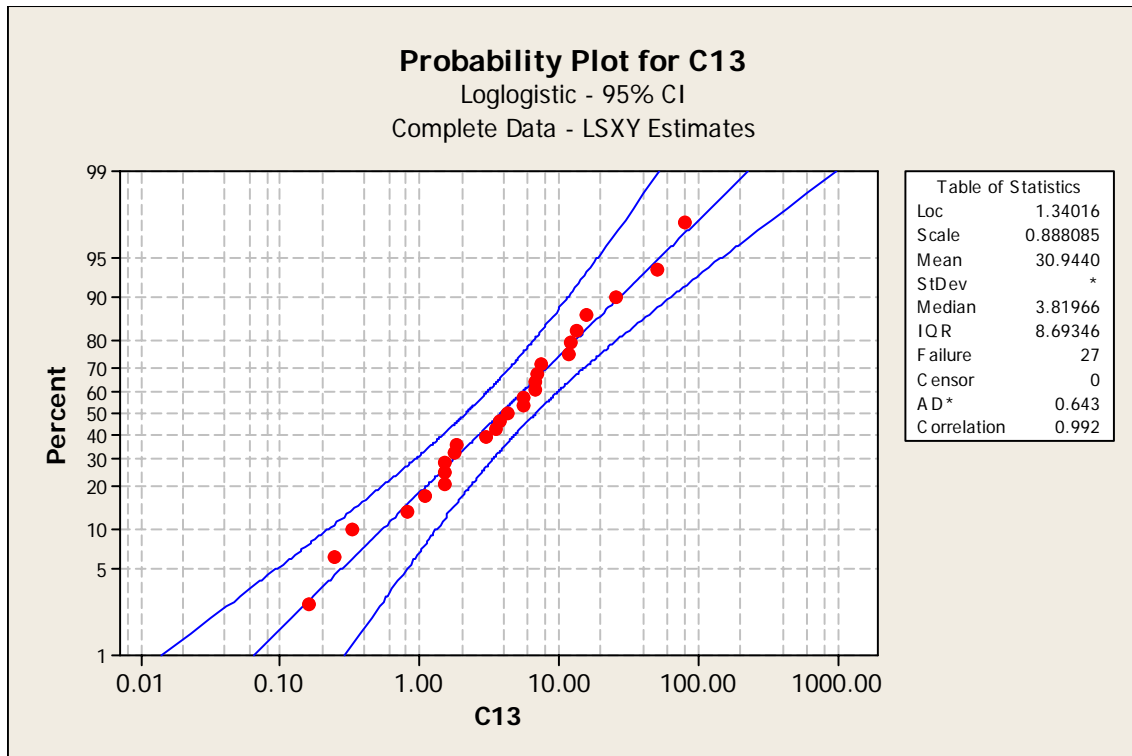


Figura 5 Gráfica de probabilidad de piezas de fallo único en máquina 5

Variable: C13

Censoring Information Count
 Uncensored value 27

Estimation Method: Least Squares (failure time(X) on rank(Y))

Distribution: Loglogistic

Parameter Estimates

Parameter	Estimate	Standard Error	95.0% Normal CI	
			Lower	Upper
Location	1.34016	0.293735	0.764450	1.91587
Scale	0.888085	0.152045	0.634928	1.24218

Log-Likelihood = -85.279

Goodness-of-Fit

Anderson-Darling (adjusted) = 0.643
 Correlation Coefficient = 0.992

Characteristics of Distribution

	Estimate	Standard Error	95.0% Normal CI	
			Lower	Upper
Mean(MTTF)	30.9440	46.0105	1.67854	570.457
Standard Deviation	*	*	*	*

Median	3.81966	1.12197	2.14781	6.79286
First Quartile(Q1)	1.43979	0.497542	0.731400	2.83430
Third Quartile(Q3)	10.1333	3.34474	5.30626	19.3513
Interquartile Range(IQR)	8.69346	3.11951	4.30281	17.5644

Table of Percentiles

Percent	Percentile	Standard Error	95.0% Normal CI	
			Lower	Upper
1	0.0645253	0.0498267	0.0142046	0.293110
2	0.120500	0.0812782	0.0321249	0.451991
3	0.174311	0.107760	0.0518933	0.585518
4	0.227132	0.131444	0.0730600	0.706120
5	0.279500	0.153274	0.0954101	0.818785
6	0.331729	0.173773	0.118820	0.926140
7	0.384028	0.193269	0.143212	1.02978
8	0.436550	0.211991	0.168534	1.13079
9	0.489415	0.230101	0.194751	1.22991
10	0.542720	0.247728	0.221839	1.32774
20	1.11518	0.413235	0.539420	2.30548
30	1.79982	0.588497	0.948218	3.41626
40	2.66465	0.808283	1.47042	4.82881
50	3.81966	1.12197	2.14781	6.79286
60	5.47531	1.62562	3.05975	9.79785
70	8.10624	2.54852	4.37733	15.0117
80	13.0829	4.60894	6.55902	26.0959
90	26.8827	11.6382	11.5072	62.8027
91	29.8107	13.2986	12.4351	71.4652
92	33.4206	15.4078	13.5390	82.4977
93	37.9915	18.1661	14.8824	96.9838
94	43.9811	21.9111	16.5654	116.770
95	52.1996	27.2580	18.7577	145.263
96	64.2347	35.4534	21.7752	189.486
97	83.6995	49.4508	26.2919	266.455
98	121.077	78.2698	34.1043	429.850
99	226.110	168.072	52.6748	970.589