

**UNIVERSITY OF ESWATINI**  
**FACULTY OF SOCIAL SCIENCES**  
**DEPARTMENT OF ECONOMICS**  
**RE-SIT EXAMINATION**

**July 2019**

**TITLE OF PAPER:** MATHEMATICS FOR ECONOMISTS II  
**COURSE CODE:** ECO206 / IDE – ECO206  
**TIME ALLOWED:** 2 HOURS  
**INSTRUCTIONS:** ANSWER ANY FOUR QUESTIONS [20 MARKS EACH]

**REQUIREMENTS**

- SCIENTIFIC CALCULATOR
- STATISTICAL TABLES

**DO NOT OPEN THIS PAPER UNTIL YOU HAVE BEEN INSTRUCTED TO DO SO**

### Question 1

(a) Heritage Properties is a national company specializing in rental office accommodation. An analysis of lease records in Durban branch has established that, on average, five lease agreements are signed in the Durban Metropolitan Area.

- i. What is the probability that, on a given day, the Durban branch will sign only three lease agreements for office space? [2]
- ii. What is the probability that on any given day, the Durban branch will sign at most two lease agreements for office space? [2]
- iii. What is the probability that the Durban Branch will sign more than four lease agreements for office space on any given day? [3]
- iv. What is the probability that the Durban office will sign will sign more than four lease agreements for office space in any two-day period? [3]

(b) A courier service company has found that their delivery time of parcels to clients is normally distributed with a mean of 45 minutes ( $\mu = 45$ ) and a standard deviation of eight minutes ( $\sigma = 8$ ).

(b) What is the probability that a randomly selected parcel:

- (i) Will take between 45 and 51 minutes to deliver to the client? [5]
- (ii) Will take less than 48 minutes to deliver? [5]

### Question 2

(a) Assume that the purchase value of transactions,  $x$ , at a national clothing store such as Edgars, is normally distributed with a mean of R244 and a standard deviation of R68.

- (i) What is the minimum purchase value of transactions for the highest-spending 15% of clothing store customers? [5]

(ii) What purchase value of transactions separates the lowest-spending 20% of clothing store customers from the remaining customers?

[5]

(b) A human resources director at the Chamber of Mines wishes to estimate the true mean employment period of all coalminers. From a random sample of 144 coalminers' records, the sample mean employment period was found to be 88.4 months. The population standard deviation is assumed to be 21.5 months and normally distributed.

Find the 95 % confidence interval estimate for the actual mean employment period (in months) for all miners employed in coal mines. [10]

### Question 3

(a) Define the following terms, giving relevant examples

[2 marks Each]

- Population
- Census
- Sample
- Probability sampling methods
- Non probability sampling methods
- Statistic
- Parameter
- Point estimate
- Interval estimate
- Confidence interval

### Question 4

An international study on executive working hours reported that company CEOs (chief executive officers) worked *more than* 60 hours per week on average. The South African Institute of Management (SAIM) wanted to test whether this norm applied to South African CEOs as well.

A random sample of 90 CEOs from South African companies was drawn, and each executive was asked to record the number of hours worked during a given week. The sample mean number

of hours worked per week was found to be 61.3 hours. Assume a normal distribution for weekly hours worked and a population standard deviation of 8.8 hours.

Do South African CEOs work *more than* 60 hours per week, on average? Test this claim at the 5% level of significance. [20]

### Question 5

A mobile phone service provider, Cell D Mobile, claims that it has 15% of the prepaid mobile phone market. A competitor, who commissioned a market research company to conduct a survey amongst prepaid mobile phone users, challenged this claim. The market research company randomly sampled 360 prepaid mobile users and found that 42 users subscribe to Cell D Mobile as a service provider.

(a) Test, at the 1% level of significance, Cell D Mobile's claim that they have a 15% share of the prepaid mobile phone market. [10]

(b) Test at the 10% level of significance, whether Cell D Mobile's share of the prepaid mobile phone market is significantly *less than* 15%. Use the same market research data as for (a) above.

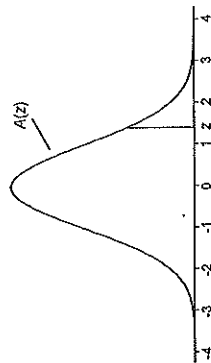
[10]

# STATISTICAL TABLES

- Cumulative normal distribution
- Critical values of the *t* distribution
- Critical values of the *F* distribution
- Critical values of the chi-squared distribution

TABLE A.1  
Cumulative Standardized Normal Distribution

$A(z)$  is the integral of the standardized normal distribution from  $-\infty$  to  $z$  (in other words, the area under the curve to the left of  $z$ ). It gives the probability of a normal random variable not being more than  $z$  standard deviations above its mean. Values of  $z$  of particular importance:



$z$	$A(z)$	Lower limit of right 5% tail	Lower limit of right 2.5% tail	Lower limit of right 1% tail	Lower limit of right 0.5% tail	Lower limit of right 0.1% tail	Lower limit of right 0.05% tail
1.645	0.9500						
1.960	0.9750						
2.326	0.9900						
2.576	0.9950						
3.090	0.9990						
3.291	0.9995						

$z$	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8483	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9873	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9923	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998
3.5	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
3.6	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998

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TABLE A.2

F Distribution: Critical Values of t

Degrees of freedom	Significance level				
	10%	5%	2.5%	1%	0.5%
1	6.314	12.706	31.821	63.657	127.329
2	2.920	4.303	6.965	9.925	15.999
3	2.353	3.182	4.541	5.841	10.215
4	2.132	2.776	3.747	4.604	7.173
5	2.015	2.571	3.365	4.032	5.893
6	1.943	2.447	3.143	3.707	5.208
7	1.894	2.365	2.998	3.499	4.785
8	1.860	2.306	2.906	3.355	4.501
9	1.833	2.262	2.821	3.250	4.297
10	1.812	2.228	2.764	3.169	4.144
11	1.796	2.201	2.718	3.106	4.025
12	1.782	2.179	2.681	3.055	3.930
13	1.771	2.160	2.650	3.012	3.852
14	1.761	2.145	2.624	2.977	3.787
15	1.753	2.131	2.602	2.947	3.735
16	1.746	2.120	2.583	2.921	3.686
17	1.740	2.110	2.567	2.898	3.646
18	1.734	2.101	2.552	2.878	3.610
19	1.729	2.093	2.539	2.861	3.579
20	1.725	2.086	2.528	2.845	3.552
21	1.721	2.080	2.518	2.831	3.527
22	1.717	2.074	2.508	2.819	3.505
23	1.714	2.069	2.500	2.807	3.485
24	1.711	2.064	2.492	2.797	3.467
25	1.708	2.060	2.485	2.787	3.450
26	1.706	2.056	2.479	2.779	3.435
27	1.703	2.052	2.473	2.771	3.421
28	1.701	2.048	2.467	2.763	3.408
29	1.699	2.045	2.462	2.756	3.396
30	1.697	2.042	2.457	2.750	3.385
32	1.694	2.037	2.449	2.738	3.365
34	1.691	2.032	2.441	2.728	3.348
36	1.688	2.028	2.434	2.719	3.333
38	1.686	2.024	2.429	2.712	3.319
40	1.684	2.021	2.423	2.704	3.307
42	1.682	2.018	2.418	2.698	3.296
44	1.680	2.015	2.414	2.692	3.286
46	1.679	2.013	2.410	2.687	3.277
48	1.677	2.011	2.407	2.682	3.269
50	1.676	2.009	2.403	2.678	3.261
60	1.671	2.000	2.390	2.660	3.232
70	1.667	1.994	2.381	2.645	3.211
80	1.664	1.990	2.374	2.639	3.195
90	1.662	1.987	2.368	2.632	3.183
100	1.660	1.984	2.364	2.626	3.174
120	1.658	1.980	2.358	2.617	3.173
150	1.655	1.976	2.351	2.609	3.145
200	1.653	1.972	2.345	2.601	3.131
300	1.650	1.968	2.339	2.592	3.118
400	1.649	1.966	2.336	2.588	3.111
500	1.648	1.965	2.334	2.586	3.107
600	1.647	1.964	2.333	2.584	3.104
∞	1.645	1.960	2.326	2.576	3.090

TABLE A.3

F Distribution: Critical Values of F (5% significance level)

$v_1$	1	2	3	4	5	6	8	9	10	12	14	16	18	20
1	161.45	199.50	215.71	224.58	230.16	233.99	236.77	238.88	240.54	241.88	243.51	245.36	246.46	247.32
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38	19.40	19.41	19.42	19.43	19.44
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.78	8.77	8.76	8.66
4	7.71	6.94	6.59	6.26	6.16	6.09	6.04	6.00	5.96	5.91	5.87	5.84	5.82	5.80
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.68	4.64	4.60	4.56
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.00	3.96	3.92	3.87
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.57	3.53	3.49	3.44
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.28	3.24	3.20	3.15
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.07	3.03	2.99	2.94
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.91	2.86	2.83	2.77
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.79	2.74	2.70	2.65
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.69	2.64	2.60	2.54
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.60	2.55	2.51	2.46
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.53	2.48	2.44	2.39
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.48	2.42	2.38	2.33
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.42	2.37	2.33	2.28
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.38	2.33	2.29	2.25
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.34	2.29	2.25	2.21
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.31	2.26	2.21	2.16
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.28	2.22	2.18	2.12
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.25	2.20	2.16	2.10
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.23	2.17	2.13	2.07
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.20	2.15	2.11	2.05
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.18	2.13	2.09	2.03
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.16	2.11	2.07	2.01
26	4.22	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27	2.22	2.15	2.09	2.05	1.99
27	4.21	3.35	2.96	2.73	2.57	2.45	2.37	2.31	2.25	2.20	2.13	2.08	2.04	1.97
28	4.20	3.34	2.95	2.71	2.56	2.44	2.36	2.29	2.24	2.19	2.12	2.06	2.02	1.96
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22	2.18	2.10	2.05	2.01	1.94
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16	2.09	2.04	1.99	1.93
35	4.12	3.27	2.87	2.64	2.49	2.37	2.29	2.22	2.16	2.11	2.04	1.99	1.94	1.88
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.08	2.00	1.95	1.90	1.84
50	4.03	3.18	2.79	2.56	2.40	2.29	2.20	2.13	2.07	2.03	1.95	1.89	1.85	1.78
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04	1.99	1.92	1.86	1.82	1.75
70	3.98	3.13	2.74	2.50	2.35	2.23	2.14	2.07	2.02	1.97	1.89	1.84	1.79	1.72
80	3.96	3.11	2.72	2.49	2.33	2.21	2.13	2.06	2.00	1.95	1.88	1.82	1.77	1.70
90	3.95	3.10	2.71	2.47	2.32	2.20	2.11	2.04	1.99	1.94	1.86	1.80	1.76	1.69
100	3.94	3.09	2.70	2.46	2.31	2.19	2.10	2.03	1.97	1.93	1.85	1.79	1.75	1.68
120	3.92	3.07	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.83	1.78	1.73	1.66
150	3.90	3.06	2.66	2.43	2.27	2.16	2.07	2.00	1.94	1.89	1.82	1.76	1.71	1.64
200	3.89	3.04	2.65	2.42	2.26	2.14	2.06	1.98	1.93	1.88	1.80	1.74	1.69	1.62
250	3.88	3.03	2.64	2.41	2.25	2.13	2.05	1.98	1.92	1.87	1.79	1.73	1.68	1.61
300	3.87	3.03	2.63	2.40	2.24	2.12	2.04	1.97	1.91	1.86	1.78	1.72	1.67	1.61
400	3.86	3.02	2.63	2.39	2.24	2.12	2.03	1.96	1.90	1.85	1.78	1.72	1.67	1.60
500	3.86	3.01	2.62	2.39	2.23	2.12	2.03	1.96	1.90	1.85	1.77	1.71	1.66	1.59
600	3.86	3.01	2.62	2.39	2.23	2.11	2.02	1.95	1.90	1.85	1.77	1.71	1.66	1.59
750	3.85	3.01	2.62	2.38	2.23	2.11	2.02	1.95	1.89	1.84	1.77	1.70	1.66	1.58
1000	3.85	3.00	2.61	2.38	2.22	2.11	2.02	1.95	1.89	1.84	1.76	1.70	1.65	1.58

TABLE A.3 (continued)  
F Distribution: Critical Values of F (5% significance level)

Table with 20 columns (v1 to v2) and 100 rows of critical values for the F distribution at a 5% significance level.

TABLE A.3 (continued)  
F Distribution: Critical Values of F (1% significance level)

Table with 20 columns (v1 to v2) and 100 rows of critical values for the F distribution at a 1% significance level.

TABLE A.3 (continued)

F Distribution: Critical Values of F (1% significance level)

Table with columns for degrees of freedom (v1, v2) and rows for various values of v2. It provides critical values for the F-distribution at a 1% significance level.

TABLE A.3 (continued)

F Distribution: Critical Values of F (0.1% significance level)

Table with columns for degrees of freedom (v1, v2) and rows for various values of v2. It provides critical values for the F-distribution at a 0.1% significance level.



TABLE A.3 (continued)

F Distribution: Critical Values of F (0.1% significance level)

$v_1$	25	30	35	40	50	60	75	100	150	200
1	6.2405	6.2605	6.2805	6.3005	6.3205	6.3405	6.3605	6.3805	6.4005	6.4205
2	9.9946	9.9947	9.9947	9.9947	9.9947	9.9947	9.9947	9.9947	9.9947	9.9947
3	12.584	12.585	12.586	12.587	12.588	12.589	12.590	12.591	12.592	12.593
4	15.522	15.523	15.524	15.525	15.526	15.527	15.528	15.529	15.530	15.531
5	18.508	18.509	18.510	18.511	18.512	18.513	18.514	18.515	18.516	18.517
6	21.575	21.576	21.577	21.578	21.579	21.580	21.581	21.582	21.583	21.584
7	24.718	24.719	24.720	24.721	24.722	24.723	24.724	24.725	24.726	24.727
8	27.928	27.929	27.930	27.931	27.932	27.933	27.934	27.935	27.936	27.937
9	31.196	31.197	31.198	31.199	31.200	31.201	31.202	31.203	31.204	31.205
10	34.522	34.523	34.524	34.525	34.526	34.527	34.528	34.529	34.530	34.531
11	37.906	37.907	37.908	37.909	37.910	37.911	37.912	37.913	37.914	37.915
12	41.348	41.349	41.350	41.351	41.352	41.353	41.354	41.355	41.356	41.357
13	44.848	44.849	44.850	44.851	44.852	44.853	44.854	44.855	44.856	44.857
14	48.406	48.407	48.408	48.409	48.410	48.411	48.412	48.413	48.414	48.415
15	52.022	52.023	52.024	52.025	52.026	52.027	52.028	52.029	52.030	52.031
16	55.696	55.697	55.698	55.699	55.700	55.701	55.702	55.703	55.704	55.705
17	59.428	59.429	59.430	59.431	59.432	59.433	59.434	59.435	59.436	59.437
18	63.218	63.219	63.220	63.221	63.222	63.223	63.224	63.225	63.226	63.227
19	67.066	67.067	67.068	67.069	67.070	67.071	67.072	67.073	67.074	67.075
20	70.972	70.973	70.974	70.975	70.976	70.977	70.978	70.979	70.980	70.981
21	74.936	74.937	74.938	74.939	74.940	74.941	74.942	74.943	74.944	74.945
22	78.958	78.959	78.960	78.961	78.962	78.963	78.964	78.965	78.966	78.967
23	83.038	83.039	83.040	83.041	83.042	83.043	83.044	83.045	83.046	83.047
24	87.176	87.177	87.178	87.179	87.180	87.181	87.182	87.183	87.184	87.185
25	91.372	91.373	91.374	91.375	91.376	91.377	91.378	91.379	91.380	91.381
26	95.626	95.627	95.628	95.629	95.630	95.631	95.632	95.633	95.634	95.635
27	99.938	99.939	99.940	99.941	99.942	99.943	99.944	99.945	99.946	99.947
28	104.308	104.309	104.310	104.311	104.312	104.313	104.314	104.315	104.316	104.317
29	108.736	108.737	108.738	108.739	108.740	108.741	108.742	108.743	108.744	108.745
30	113.222	113.223	113.224	113.225	113.226	113.227	113.228	113.229	113.230	113.231
35	124.342	124.343	124.344	124.345	124.346	124.347	124.348	124.349	124.350	124.351
40	136.122	136.123	136.124	136.125	136.126	136.127	136.128	136.129	136.130	136.131
45	148.622	148.623	148.624	148.625	148.626	148.627	148.628	148.629	148.630	148.631
50	161.822	161.823	161.824	161.825	161.826	161.827	161.828	161.829	161.830	161.831
55	175.722	175.723	175.724	175.725	175.726	175.727	175.728	175.729	175.730	175.731
60	190.322	190.323	190.324	190.325	190.326	190.327	190.328	190.329	190.330	190.331
65	205.622	205.623	205.624	205.625	205.626	205.627	205.628	205.629	205.630	205.631
70	221.622	221.623	221.624	221.625	221.626	221.627	221.628	221.629	221.630	221.631
80	248.222	248.223	248.224	248.225	248.226	248.227	248.228	248.229	248.230	248.231
90	276.222	276.223	276.224	276.225	276.226	276.227	276.228	276.229	276.230	276.231
100	305.622	305.623	305.624	305.625	305.626	305.627	305.628	305.629	305.630	305.631
120	354.222	354.223	354.224	354.225	354.226	354.227	354.228	354.229	354.230	354.231
150	418.222	418.223	418.224	418.225	418.226	418.227	418.228	418.229	418.230	418.231
200	500.222	500.223	500.224	500.225	500.226	500.227	500.228	500.229	500.230	500.231
250	590.222	590.223	590.224	590.225	590.226	590.227	590.228	590.229	590.230	590.231
300	690.222	690.223	690.224	690.225	690.226	690.227	690.228	690.229	690.230	690.231
400	850.222	850.223	850.224	850.225	850.226	850.227	850.228	850.229	850.230	850.231
500	1000.222	1000.223	1000.224	1000.225	1000.226	1000.227	1000.228	1000.229	1000.230	1000.231
600	1150.222	1150.223	1150.224	1150.225	1150.226	1150.227	1150.228	1150.229	1150.230	1150.231
750	1350.222	1350.223	1350.224	1350.225	1350.226	1350.227	1350.228	1350.229	1350.230	1350.231
1000	1700.222	1700.223	1700.224	1700.225	1700.226	1700.227	1700.228	1700.229	1700.230	1700.231

TABLE A.4

$\chi^2$  (Chi-Squared) Distribution: Critical Values of  $\chi^2$

Degree of freedom	Significance level		
	5%	1%	0.1%
1	3.841	6.635	10.828
2	5.991	9.210	13.816
3	7.879	11.345	16.266
4	9.488	13.277	18.467
5	11.070	15.086	20.515
6	12.592	16.812	22.458
7	14.067	18.475	24.322
8	15.507	20.090	26.124
9	16.919	21.666	27.877
10	18.307	23.209	29.588