Queen Mary
University of London

May Examination Period 2022-23

ECN121 Statistical Methods in Economics **Duration: 2 hours**

YOU ARE NOT PERMITTED TO READ THE CONTENTS OF THIS QUESTION PAPER UNTIL INSTRUCTED TO DO SO BY AN INVIGILATOR

Answer ALL questions

The exam paper consists of two sections. You should attempt all the questions in the two sections. Show any steps to reach your final answer. Cross out any answers that you do not wish to be marked. A four-page appendix with the z and t statistical tables is available at the end of the paper.

Only nonprogrammable calculators are permitted in this examination. Please state on your answer book the name and type of machine used.

Complete all rough workings in the answer book and cross through any work that is not to be assessed.

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EXAM PAPERS MUST NOT BE REMOVED FROM THE EXAM ROOM

Examiner: Dr. Jinu Lee

Section A - Knowledge, Understanding, and Application

Question 1

An Alpha company considers redeveloping its marketing strategy. The probability that a new marketing approach will be successful is assessed as being 0.60. The probability that the expenditure for developing the approach can be kept within the original budget is 0.50. The probability that both of these objectives will be achieved is estimated at 0.30.

a) What is the probability that at least one of these objectives will be achieved? **[4 marks]**

b) What is the probability that the new marketing approach will be successful given that the development cost was kept within the original budget? **[3 marks]**

c) Are the two events "successful marketing approach" and "kept within budget" independent events? Justify your answer. **[3 marks]**

Question 2

According to recent research for persons infected with a certain type of malaria, the length of time spent in remission X is described by the following probability density distribution (PDF):

$$f(x) = \begin{cases} \frac{1}{9}x^2, & 0 \leq x \leq 3 \\ 0, & otherwise \end{cases}$$

where X is measured in years.

a) Show that the PDF is well defined. Also, define and derive the corresponding cumulative distribution function to the PDF. **[4 marks]**

b) What is the probability that a malaria patient's remission lasts longer than one year? **[3 marks]**

c) Suppose that the yearly cost of treating a patient suffering from malaria is £45. What is the yearly average cost per patient? What is the variance of the cost? **[3 marks]**

Question 3

Lenovo, the laptop manufacturer, is launching a new promotional campaign. Purchasers of a new laptop may, if dissatisfied for any reason, return them within 2 days of purchase and receive a full refund. The cost to the dealer of such a refund is £100. The dealer estimates that 15% of all purchasers will indeed return laptops and obtain refunds. Suppose that 50 laptops are purchased during the promotion period.

a) What is the probability that 10 laptops will be returned? **[3 marks]**

b) What are the mean and standard deviation of the number of laptops that the dealer expects to be returned for refunds? **[4 marks]**

c) What are the mean and the standard deviation of the total refund costs that will accrue as a result of these 50 purchases? **[3 marks]**

Question 4

The Sports Department at Queen Mary University estimates that the population of students spends an average of 5.5 hours per week playing organised sports. The population's standard deviation is 2.2 hours per week. In order to investigate the students' attitude towards sports activities, a sample of 121 students is collected.

a) The Head of Department is worried that no statistical analysis can be carried out because the population distribution is unknown. How would you address this concern? Explain. **[4 marks]**

b) Find the probability that students spend on average between 5 and 6 hours doing sport. **[3 marks]**

c) How unlikely would it be to obtain a sample mean greater than 6.5 hours? Justify your answer. **[3 marks]**

Question 5

In the summer of 2022 a poll on the BBC Sport website showed that out of 2000 respondents, 71% felt that Roger Federer deserved to be ranked among the greatest tennis players ever.

a) Assuming that the 2000 respondents form a random sample of the population of tennis fans, construct a 95% confidence interval for the proportion of all tennis fans who feel that Roger Federer should be ranked among the greatest tennis players ever. **[4 marks]**

b) Based on a), would you be comfortable in saying that 19 times out of 20 the poll is accurate to within plus or minus 2 percentage point? Explain. **[3 marks]**

c) In actuality, the survey was based on voluntary responses from readers of the BBC Sport website. Do you think the 2000 respondents actually formed random sample? Explain. **[3 marks]**

Section B - Analysis, Evaluation, and Synthesis

Question 6

Suppose that there are two assets of X_1 and X_2 whose payoffs are described by the following joint probability distribution:

	X_1=-1	X_1=0	X_1=1
X_2=-1	0.0	0.1	0.1
X_2=0	0.1	0.2	0.2
X_2=1	0.1	0.1	0.1

a) Compute the average gain and variance of the portfolio A consisting of the two assets only, i.e. $A = \pi X_1 + (1-\pi)X_2$ where π is a weight of X_1 in the portfolio and $0 \leq \pi \leq 1$. **[7 marks]**

b) Find the portfolio A with minimum variance. What is its expected gain and variance? **[8 marks]**

Question 7

A group of economists are interested in estimating the differences in house prices between the Southern and Northern England. Suppose that house prices in Southern England (X) have a distribution with mean μ_X and standard deviation σ_X while house prices in Northern England (Y) have a distribution characterised by a mean μ_Y and standard deviation σ_Y. Suppose that the following samples of 10 house prices were collected from the two regions (prices are in thousands of pounds):

X	234	412	321	225	198	213	278	345	468	304
Y	154	213	112	167	324	98	187	231	280	156

The economists intend to use the following estimator in order to estimate the difference in house prices in the two regions: $\hat{\theta} = \bar{X} - \bar{Y}$.

a) Explain why the economists might suggest using such an estimator. Justify your answer. **[10 marks]**

b) Provide an estimate of the difference in house prices across the two regions. **[5 marks]**

Question 8

For the production process of ballpoint pens of a certain type, it is known that 5% of the pens are defective. The manager believes that this percentage is too high and hence changes the production process by introducing some new and more accurate technology. You have been asked to test whether the new production process has led to any reduction of defective ballpoint pens. To this end, you collect a sample of 350 pens from which you identify 9 defective ones.

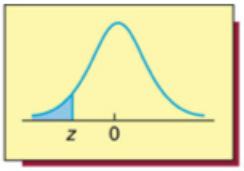
a) Provide an analysis, that includes both an estimated confidence interval and a hypothesis test, to investigate the effectiveness of the new technology. What would your recommendation to the manager be? Discuss your results. **[10 marks]**

b) Suppose that the manager is interested in a 90% confidence interval for the defective rate with a width at most 0.01. What should the manager do in order to construct such a confidence interval? Justify your answer. **[10 marks]**

End of Paper - An Appendix of 5 pages follows

STATISTICAL TABLES

Cumulative areas under the standard normal curve



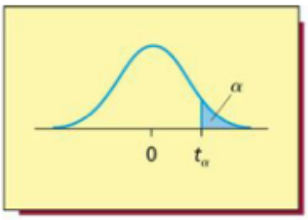
z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
−3.9	0.00005	0.00005	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00003	0.00003
−3.8	0.00007	0.00007	0.00007	0.00006	0.00006	0.00006	0.00006	0.00005	0.00005	0.00005
−3.7	0.00011	0.00010	0.00010	0.00010	0.00009	0.00009	0.00008	0.00008	0.00008	0.00008
−3.6	0.00016	0.00015	0.00015	0.00014	0.00014	0.00013	0.00013	0.00012	0.00012	0.00011
−3.5	0.00023	0.00022	0.00022	0.00021	0.00020	0.00019	0.00019	0.00018	0.00017	0.00017
−3.4	0.00034	0.00032	0.00031	0.00030	0.00029	0.00028	0.00027	0.00026	0.00025	0.00024
−3.3	0.00048	0.00047	0.00045	0.00043	0.00042	0.00040	0.00039	0.00038	0.00036	0.00035
−3.2	0.00069	0.00066	0.00064	0.00062	0.00060	0.00058	0.00056	0.00054	0.00052	0.00050
−3.1	0.00097	0.00094	0.00090	0.00087	0.00084	0.00082	0.00079	0.00076	0.00074	0.00071
−3.0	0.00135	0.00131	0.00126	0.00122	0.00118	0.00114	0.00111	0.00107	0.00103	0.00100
−2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
−2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
−2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
−2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
−2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
−2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
−2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
−2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
−2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
−2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
−1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
−1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
−1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
−1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
−1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
−1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
−1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
−1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
−1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
−1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
−0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
−0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
−0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
−0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2482	0.2451
−0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
−0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
−0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
−0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
−0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
−0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641

Turn Over

Cumulative areas under the standard normal curve (continued)

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	0.7518	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	0.8485	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	0.9875	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	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
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	0.99865	0.99869	0.99874	0.99878	0.99882	0.99886	0.99889	0.99893	0.99897	0.99900
3.1	0.99903	0.99906	0.99910	0.99913	0.99916	0.99918	0.99921	0.99924	0.99926	0.99929
3.2	0.99931	0.99934	0.99936	0.99938	0.99940	0.99942	0.99944	0.99946	0.99948	0.99950
3.3	0.99952	0.99953	0.99955	0.99957	0.99958	0.99960	0.99961	0.99962	0.99964	0.99965
3.4	0.99966	0.99968	0.99969	0.99970	0.99971	0.99972	0.99973	0.99974	0.99975	0.99976
3.5	0.99977	0.99978	0.99978	0.99979	0.99980	0.99981	0.99981	0.99982	0.99983	0.99983
3.6	0.99984	0.99985	0.99985	0.99986	0.99986	0.99987	0.99987	0.99988	0.99988	0.99989
3.7	0.99989	0.99990	0.99990	0.99990	0.99991	0.99991	0.99992	0.99992	0.99992	0.99992
3.8	0.99993	0.99993	0.99993	0.99994	0.99994	0.99994	0.99994	0.99995	0.99995	0.99995
3.9	0.99995	0.99995	0.99996	0.99996	0.99996	0.99996	0.99996	0.99996	0.99997	0.99997

t-table: values of t_α for df = 1 through 48



df	$t_{.100}$	$t_{.05}$	$t_{.025}$	$t_{.01}$	$t_{.005}$	$t_{.001}$	$t_{.0005}$
1	3.078	6.314	12.706	31.821	63.657	318.309	636.619
2	1.886	2.920	4.303	6.965	9.925	22.327	31.599
3	1.638	2.353	3.182	4.541	5.841	10.215	12.924
4	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	1.319	1.714	2.069	2.500	2.807	3.485	3.768
24	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	1.316	1.708	2.060	2.485	2.787	3.450	3.725
26	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	1.314	1.703	2.052	2.473	2.771	3.421	3.690
28	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	1.311	1.699	2.045	2.462	2.756	3.396	3.659
30	1.310	1.697	2.042	2.457	2.750	3.385	3.646
31	1.309	1.696	2.040	2.453	2.744	3.375	3.633
32	1.309	1.694	2.037	2.449	2.738	3.365	3.622
33	1.308	1.692	2.035	2.445	2.733	3.356	3.611
34	1.307	1.691	2.032	2.441	2.728	3.348	3.601
35	1.306	1.690	2.030	2.438	2.724	3.340	3.591
36	1.306	1.688	2.028	2.434	2.719	3.333	3.582
37	1.305	1.687	2.026	2.431	2.715	3.326	3.574
38	1.304	1.686	2.024	2.429	2.712	3.319	3.566
39	1.304	1.685	2.023	2.426	2.708	3.313	3.558
40	1.303	1.684	2.021	2.423	2.704	3.307	3.551
41	1.303	1.683	2.020	2.421	2.701	3.301	3.544
42	1.302	1.682	2.018	2.418	2.698	3.296	3.538
43	1.302	1.681	2.017	2.416	2.695	3.291	3.532
44	1.301	1.680	2.015	2.414	2.692	3.286	3.526
45	1.301	1.679	2.014	2.412	2.690	3.281	3.520
46	1.300	1.679	2.013	2.410	2.687	3.277	3.515
47	1.300	1.678	2.012	2.408	2.685	3.273	3.510
48	1.299	1.677	2.011	2.407	2.682	3.269	3.505

t-table: values of t_α for df = 49 through 100, 120 and ∞

df	$t_{.100}$	$t_{.05}$	$t_{.025}$	$t_{.01}$	$t_{.005}$	$t_{.001}$	$t_{.0005}$
49	1.299	1.677	2.010	2.405	2.680	3.265	3.500
50	1.299	1.676	2.009	2.403	2.678	3.261	3.496
51	1.298	1.675	2.008	2.402	2.676	3.258	3.492
52	1.298	1.675	2.007	2.400	2.674	3.255	3.488
53	1.298	1.674	2.006	2.399	2.672	3.251	3.484
54	1.297	1.674	2.005	2.397	2.670	3.248	3.480
55	1.297	1.673	2.004	2.396	2.668	3.245	3.476
56	1.297	1.673	2.003	2.395	2.667	3.242	3.473
57	1.297	1.672	2.002	2.394	2.665	3.239	3.470
58	1.296	1.672	2.002	2.392	2.663	3.237	3.466
59	1.296	1.671	2.001	2.391	2.662	3.234	3.463
60	1.296	1.671	2.000	2.390	2.660	3.232	3.460
61	1.296	1.670	2.000	2.389	2.659	3.229	3.457
62	1.295	1.670	1.999	2.388	2.657	3.227	3.454
63	1.295	1.669	1.998	2.387	2.656	3.225	3.452
64	1.295	1.669	1.998	2.386	2.655	3.223	3.449
65	1.295	1.669	1.997	2.385	2.654	3.220	3.447
66	1.295	1.668	1.997	2.384	2.652	3.218	3.444
67	1.294	1.668	1.996	2.383	2.651	3.216	3.442
68	1.294	1.668	1.995	2.382	2.650	3.214	3.439
69	1.294	1.667	1.995	2.382	2.649	3.213	3.437
70	1.294	1.667	1.994	2.381	2.648	3.211	3.435
71	1.294	1.667	1.994	2.380	2.647	3.209	3.433
72	1.293	1.666	1.993	2.379	2.646	3.207	3.431
73	1.293	1.666	1.993	2.379	2.645	3.206	3.429
74	1.293	1.666	1.993	2.378	2.644	3.204	3.427
75	1.293	1.665	1.992	2.377	2.643	3.202	3.425
76	1.293	1.665	1.992	2.376	2.642	3.201	3.423
77	1.293	1.665	1.991	2.376	2.641	3.199	3.421
78	1.292	1.665	1.991	2.375	2.640	3.198	3.420
79	1.292	1.664	1.990	2.374	2.640	3.197	3.418
80	1.292	1.664	1.990	2.374	2.639	3.195	3.416
81	1.292	1.664	1.990	2.373	2.638	3.194	3.415
82	1.292	1.664	1.989	2.373	2.637	3.193	3.413
83	1.292	1.663	1.989	2.372	2.636	3.191	3.412
84	1.292	1.663	1.989	2.372	2.636	3.190	3.410
85	1.292	1.663	1.988	2.371	2.635	3.189	3.409
86	1.291	1.663	1.988	2.370	2.634	3.188	3.407
87	1.291	1.663	1.988	2.370	2.634	3.187	3.406
88	1.291	1.662	1.987	2.369	2.633	3.185	3.405
89	1.291	1.662	1.987	2.369	2.632	3.184	3.403
90	1.291	1.662	1.987	2.368	2.632	3.183	3.402
91	1.291	1.662	1.986	2.368	2.631	3.182	3.401
92	1.291	1.662	1.986	2.368	2.630	3.181	3.399
93	1.291	1.661	1.986	2.367	2.630	3.180	3.398
94	1.291	1.661	1.986	2.367	2.629	3.179	3.397
95	1.291	1.661	1.985	2.366	2.629	3.178	3.396
96	1.290	1.661	1.985	2.366	2.628	3.177	3.395
97	1.290	1.661	1.985	2.365	2.627	3.176	3.394
98	1.290	1.661	1.984	2.365	2.627	3.175	3.393
99	1.290	1.660	1.984	2.365	2.626	3.175	3.392
100	1.290	1.660	1.984	2.364	2.626	3.174	3.390
120	1.289	1.658	1.980	2.358	2.617	3.160	3.373
∞	1.282	1.645	1.960	2.326	2.576	3.090	3.291

End of Appendix