NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, NATURAL AND RESOURCES APPLIED SCIENCES
SCHOOL OF NATURAL AND APPLIED SCIENCES
DEPARTMENT OF MATHEMATICS, STATISTICS AND ACTUARIAL SCIENCES

QUALIFICATION: BACHELOR OF ECONOMICS	
QUALIFICATION CODE: 07BECO	**LEVEL:** 6
COURSE CODE: SFE611S	**COURSE:** STATISTICS FOR ECONOMIST 2A
SESSION: JULY 2023	**PAPER :** THEORY
DURATION: 3 HRS	**MARKS:** 100

SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER	
EXAMINER	Mr. J. J. SWARTZ
MODERATOR:	Mr. A. ROUX

INSTRUCTIONS

1. Answer ALL the questions in the answer sheet provided.
2. Show clearly all the steps used in the calculations
3. All written work must be done in black ink
4. All decimal answer rounded to nearest 3 decimals spaces
5. Good Luck

PERMISSIBLE MATERIALS

1. Calculator
2. Pen and Clean Paper for calculations

ATTACHMENTS

1. Normal distribution table
2. T-table
3. Chi-square table

THIS QUESTION PAPER CONSISTS OF 5 PAGES (Including this front page)

QUESTION 1 [45 Marks]

1.1 Define the following terminologies as they are applied in statistics

(I) A sample [1]

(II) A Sample Statistic [1]

(III) Descriptive Statistics [1]

1.2. Toyota Company developed a table to report the price of the 74 vehicles sold in March 2023.

Selling prices (N$ thousands)	**Frequency**
15 up to 18	8
18 up to 21	23
21 up to 24	17
24 up to 27	18
27 up to 30	8

1.2.1 Approximate the average number of vehicles sold from Toyota Company during March 2023. [3]

1.2.2 Approximate the variance of the number of vehicles sold from Toyota Company during March 2023. [4]

1.2.3 Approximate the modal number of vehicles sold from Toyota Company [4]

1.2.4 Compute the coefficient of variation of the vehicle sold. [2]

1.2.5 Use the data from the frequency distribution to construct a cumulative "less-than" ogive. [4]

1.3. Consider a sample of 200 beer-drinkers. For each drinker we have information on sex (variable X, taking on 2 possible values: "Male" and "Female") and preferred category of beer (variable Y, taking on 3 possible values: "Light", "Regular", "Dark"). A contingency table for these data might look like the following

	Light	Regular	Dark	Total
Male	20	40	50	110
Female	50	20	20	90
Total:	70	60	70	200

1.3.1 What is the probability that he preferred "Light" category of beer? [2]

1.3.2 What is the probability that a beer drinker preferred "Regular" or "Dark" category of beer? [3]

1.3.3 What is the probability that the person is a "female" or "Light" beer drinker? [3]

1.3.4 Is the event of being a "Male" independent of "Light" beers? [2]

1.3.5 Are the events "Female" and "Dark" category mutually exclusive, why? [2]

1.4. A family has two cats (Snowy and Withy) and a dog called Rex. None of them is fond of the postman. If they are outside, the probability that Snowy, Withy and Rex will attack the postman are 30%, 40% and 15%, respectively. Only one is outside at a time, with probabilities 10%, 20% and 70%, respectively.

1.4.1. What is the probability that the postman will be attacked? [4]

1.4.3. What is the probability that Rex was the culprit? [3]

1.5.

Two events A and B are such that $P(A) = {}^{1}/_{4}$, $P(B) = {}^{3}/_{4}$, $P(A \cap B) = {}^{1}/_{8}$

1.5.1. What is the value of $P(A \text{ or } B)$? [2]

1.5.2. Are the events A and B mutually exclusive? [2]

1.5.3. Are the events A and B independent? [2]

QUESTION 2 [24 Marks]

2.1. The following table shows household income by educational level of the head of household in Windhoek last year.

	Household Income in N$ 000					
Educational level	Under 20	20-39.9	40-59.9	60-79.9	80 or More	**Total**
Not H.S graduate	4207	3459	1389	539	367	**9961**
H.S graduate	4917	6850	5027	2637	2668	**22099**
Some college	2807	5258	4678	3250	4074	**20067**
Bachelor's Degree	885	2094	2848	2581	5379	**13787**
Beyond Bach.Degree	290	829	1274	1241	4188	**7822**
Total	**13106**	**18490**	**15216**	**10248**	**16676**	**73736**

2.1.1 What is the probability of a household headed by someone with a bachelor's degree earning N$ 20-39.9 [3]

2.1.2 What is the probability that the household is headed by someone with a bachelor's degree given that he/she earns N$80 or more? [3]

2.1.3 What is the probability of a household headed by someone who is Beyond bachelor's degree or earning Under N$ 20? [3]

2.1.4 Are the event "Not H.S graduate and earning Under N$ 20" independent? [3]

2.2. Suppose you and a friend have contributed equally to a portfolio of $10 000 invested in a risky venture. The income X that will be earned on this portfolio over the next year has the following probability distribution.

X	$500	$100	$2000
P(X)	0.5	$0.3k$	0.2

2.2.1. Determine the value of k in the table above [2]

2.2.2 Determine the expected value of the income earned on this portfolio. [3]

2.3. A new medical test has been designed to detect the presence of the mysterious disease among plants. Among those that are infected with the disease, the probability that the disease will be detected by the new test is 0.60. To test the presence of the disease, the project manager randomly selected 10 plants in the area. Assuming that X is a binomial random variable: (answer correct to 4 d.p)

2.3.1 What is the probability that exactly two plants are affected [2]

2.3.2 What is the probability that at most three plants are affected [5]

QUESTION 3 [31 Marks]

3.1. Suppose X and Y have a discrete joint distribution below:

		Y			
		0	1	2	3
x	0	0	$1/30$	$2/30$	$3/30$
	1	$1/30$	$2/30$	$3/30$	$4/30$
	2	$2/30$	$3/30$	$4/30$	$5/30$

3.1.1 Find the expected value of X [3]

3.2 A machine which manufactures black polythene dustbin bags is known to produce 3% defective bags. Following a major breakdown of the machine, extensive repair work is carried out which may result in a change in the percentage of defective bags produced. To investigate this possibility, a random sample of 200 bags is taken from the machine's production and a count reveals 12 defective bags. Can it be concluded from this sample at 5% significance level that there was a change in the percentage of defective bags produced? [8]

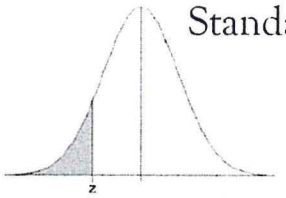
3.3. A poultry farmer is investigating ways of improving the profitability of his operation. Using a standard diet, turkeys grow to a mean mass of 4.5 kg at the age of 4 months. A sample of 20 turkeys, which were given a special enriched diet, had an average mass of 4.8 kg after 4 months. The sample standard deviation was 0.5 kg. Using the 5% significance level test whether the new enriched diet is effectively increasing the mass of the turkeys. [8]

3.4. The marketing manager of Mores Desserts would like to assess the performance of a new flavoured pudding that was launched six weeks ago. The result for a sample of 49 supermarkets countrywide indicated average sales of N$3,140 per week with a population standard deviation of N$345. Construct and interpret a 98% Confidence interval for the true population mean countrywide. [6]

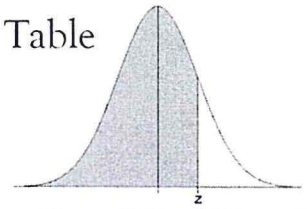
3.5. A recent survey amongst 120 street vendors in Ondangwa showed that 42 of them felt that local by-laws still hampered their trading. Construct a 95% confidence interval for the true population proportion of street vendors who believe that local by-laws still hamper their trading. [6]

**********END OF PAPER**********

Standard Normal Distribution Probabilities Table



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
−3.4	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002
−3.3	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003
−3.2	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005
−3.1	0.0010	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0007	0.0007
−3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0010	0.0010
−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	0.2483	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



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.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	0.8485	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	0.9987	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	0.9995	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

Confidence Interval Critical Values, $z_{\alpha/2}$

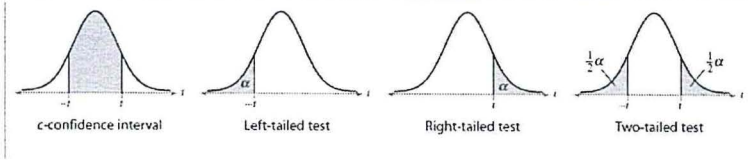
Level of Confidence	Critical Value, $z_{\alpha/2}$
0.90 or 90%	1.645
0.95 or 95%	1.96
0.98 or 98%	2.33
0.99 or 99%	2.575

Hypothesis Testing Critical Values

Level of Significance, α	Left-Tailed	Right-Tailed	Two-Tailed
0.10	− 1.28	1.28	±1.645
0.05	− 1.645	1.645	±1.96
0.01	− 2.33	2.33	±2.575

Student t Distribution Probabilities Table

	one-tail area	0.25	0.125	0.1	0.075	0.05	0.025	0.01	0.005	0.0005
	two-tail area	0.5	0.25	0.2	0.15	0.1	0.05	0.02	0.01	0.001
	confidence level	0.5	0.75	0.8	0.85	0.9	0.95	0.98	0.99	0.999
d.f.	1	1.000	2.414	3.078	4.165	6.314	12.706	31.821	63.657	636.619
	2	0.816	1.604	1.886	2.282	2.920	4.303	6.965	9.925	31.599
	3	0.765	1.423	1.638	1.924	2.353	3.182	4.541	5.841	12.924
	4	0.741	1.344	1.533	1.778	2.132	2.776	3.747	4.604	8.610
	5	0.727	1.301	1.476	1.699	2.015	2.571	3.365	4.032	6.869
	6	0.718	1.273	1.440	1.650	1.943	2.447	3.143	3.707	5.959
	7	0.711	1.254	1.415	1.617	1.895	2.365	2.998	3.499	5.408
	8	0.706	1.240	1.397	1.592	1.860	2.306	2.896	3.355	5.041
	9	0.703	1.230	1.383	1.574	1.833	2.262	2.821	3.250	4.781
	10	0.700	1.221	1.372	1.559	1.812	2.228	2.764	3.169	4.587
	11	0.697	1.214	1.363	1.548	1.796	2.201	2.718	3.106	4.437
	12	0.695	1.209	1.356	1.538	1.782	2.179	2.681	3.055	4.318
	13	0.694	1.204	1.350	1.530	1.771	2.160	2.650	3.012	4.221
	14	0.692	1.200	1.345	1.523	1.761	2.145	2.624	2.977	4.140
	15	0.691	1.197	1.341	1.517	1.753	2.131	2.602	2.947	4.073
	16	0.690	1.194	1.337	1.512	1.746	2.120	2.583	2.921	4.015
	17	0.689	1.191	1.333	1.508	1.740	2.110	2.567	2.898	3.965
	18	0.688	1.189	1.330	1.504	1.734	2.101	2.552	2.878	3.922
	19	0.688	1.187	1.328	1.500	1.729	2.093	2.539	2.861	3.883
	20	0.687	1.185	1.325	1.497	1.725	2.086	2.528	2.845	3.850
	21	0.686	1.183	1.323	1.494	1.721	2.080	2.518	2.831	3.819
	22	0.686	1.182	1.321	1.492	1.717	2.074	2.508	2.819	3.792
	23	0.685	1.180	1.319	1.489	1.714	2.069	2.500	2.807	3.768
	24	0.685	1.179	1.318	1.487	1.711	2.064	2.492	2.797	3.745
	25	0.684	1.198	1.316	1.485	1.708	2.060	2.485	2.787	3.725
	26	0.684	1.177	1.315	1.483	1.706	2.056	2.479	2.779	3.707
	27	0.684	1.176	1.314	1.482	1.703	2.052	2.473	2.771	3.690
	28	0.683	1.175	1.313	1.480	1.701	2.048	2.467	2.763	3.674
	29	0.683	1.174	1.311	1.479	1.699	2.045	2.462	2.756	3.659
	30	0.683	1.173	1.310	1.477	1.697	2.042	2.457	2.750	3.646
	35	0.682	1.170	1.306	1.472	1.690	2.030	2.438	2.724	3.591
	40	0.681	1.167	1.303	1.468	1.684	2.021	2.423	2.704	3.551
	45	0.680	1.165	1.301	1.465	1.679	2.014	2.412	2.690	3.520
	50	0.679	1.164	1.299	1.462	1.676	2.009	2.403	2.678	3.496
	60	0.679	1.162	1.296	1.458	1.671	2.000	2.390	2.660	3.460
	70	0.678	1.160	1.294	1.456	1.667	1.994	2.381	2.648	3.435
	80	0.678	1.159	1.292	1.453	1.664	1.990	2.374	2.639	3.416
	100	0.677	1.157	1.290	1.451	1.660	1.984	2.364	2.626	3.390
	500	0.675	1.152	1.283	1.442	1.648	1.965	2.334	2.586	3.310
	1000	0.675	1.151	1.282	1.441	1.646	1.962	2.330	2.581	3.300
	infinity	0.674	1.150	1.282	1.440	1.645	1.960	2.326	2.576	3.291



Chi Squared (χ^2) Distribution Probabilities

Area to the Right of Critical Value

d.f.	0.995	0.99	0.975	0.95	0.9	0.1	0.05	0.025	0.01	0.005
1	—	—	0.001	0.004	0.016	2.706	3.841	5.024	6.635	7.879
2	0.010	0.020	0.051	0.103	0.211	4.605	5.991	7.378	9.210	10.597
3	0.072	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.345	12.838
4	0.207	0.297	0.484	0.711	1.064	7.779	9.488	11.143	13.277	14.860
5	0.412	0.554	0.831	1.145	1.610	9.236	11.070	12.833	15.086	16.750
6	0.676	0.872	1.237	1.635	2.204	10.645	12.592	14.449	16.812	18.548
7	0.989	1.239	1.690	2.167	2.833	12.017	14.067	16.013	18.475	20.278
8	1.344	1.646	2.180	2.733	3.490	13.362	15.507	17.535	20.090	21.955
9	1.735	2.088	2.700	3.325	4.168	14.684	16.919	19.023	21.666	23.589
10	2.156	2.558	3.247	3.940	4.865	15.987	18.307	20.483	23.209	25.188
11	2.603	3.053	3.816	4.575	5.578	17.275	19.675	21.920	24.725	26.757
12	3.074	3.571	4.404	5.226	6.304	18.549	21.026	23.337	26.217	28.300
13	3.565	4.107	5.009	5.892	7.042	19.812	22.362	24.736	27.688	29.819
14	4.075	4.660	5.629	6.571	7.790	21.064	23.685	26.119	29.141	31.319
15	4.601	5.229	6.262	7.261	8.547	22.307	24.996	27.488	30.578	32.801
16	5.142	5.812	6.908	7.962	9.312	23.542	26.296	28.845	32.000	34.267
17	5.697	6.408	7.564	8.672	10.085	24.769	27.587	30.191	33.409	35.718
18	6.265	7.015	8.231	9.390	10.865	25.989	28.869	31.526	34.805	37.156
19	6.844	7.633	8.907	10.117	11.651	27.204	30.144	32.852	36.191	38.582
20	7.434	8.260	9.591	10.851	12.443	28.412	31.410	34.170	37.566	39.997
21	8.034	8.897	10.283	11.591	13.240	29.615	32.671	35.479	38.932	41.401
22	8.643	9.542	10.982	12.338	14.041	30.813	33.924	36.781	40.289	42.796
23	9.260	10.196	11.689	13.091	14.848	32.007	35.172	38.076	41.638	44.181
24	9.886	10.856	12.401	13.848	15.659	33.196	36.415	39.364	42.980	45.559
25	10.520	11.524	13.120	14.611	16.473	34.382	37.652	40.646	44.314	46.928
26	11.160	12.198	13.844	15.379	17.292	35.563	38.885	41.923	45.642	48.290
27	11.808	12.879	14.573	16.151	18.114	36.741	40.113	43.195	46.963	49.645
28	12.461	13.565	15.308	16.928	18.939	37.916	41.337	44.461	48.278	50.993
29	13.121	14.256	16.047	17.708	19.768	39.087	42.557	45.722	49.588	52.336
30	13.787	14.953	16.791	18.493	20.599	40.256	43.773	46.979	50.892	53.672
40	20.707	22.164	24.433	26.509	29.051	51.805	55.758	59.342	63.691	66.766
50	27.991	29.707	32.357	34.764	37.689	63.167	67.505	71.420	76.154	79.490
60	35.534	37.485	40.482	43.188	46.459	74.397	79.082	83.298	88.379	91.952
70	43.275	45.442	48.758	51.739	55.329	85.527	90.531	95.023	100.425	104.215
80	51.172	53.540	57.153	60.391	64.278	96.578	101.879	106.629	112.329	116.321
90	59.196	61.754	65.647	69.126	73.291	107.565	113.145	118.136	124.116	128.299
100	67.328	70.065	74.222	77.929	82.358	118.498	124.342	129.561	135.807	140.169