NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES

DEPARTMENT OF AGRICULTURAL SCIENCES AND AGRIBUSINESS

QUALIFICATION : BACHELOR OF SCIENCE IN AGRICULTURE	
QUALIFICATION CODE: 07BAGA	**LEVEL: 7**
COURSE CODE: AGS520S	**COURSE NAME**: AGRICULTURAL STATISTICS
SESSION: JUNE 2024	**PAPER:** 1
DURATION: 3 HOURS	**MARKS:** 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS

1. This paper consists of two sections: Section A has 15 multiple-choice questions and 5 True or False questions. Section B is made up of four essay-type questions.
2. Answer ALL questions in blue or black ink.
3. Start each question on a new page in your answer booklet.
4. Questions relating to this paper may be raised in the initial 30 minutes after the start of the examination. Thereafter, students must use their initiative to deal with any perceived error or ambiguities & any assumption made should be clearly stated.

THIS MEMO CONSISTS OF 13 PAGES (Including this front page)

SECTION A

QUESTION 1 (20 Marks)

Consider a random variable X with the following probability distribution.

X	2	4	5	8	9
P(X)	0.10	0.20	0.15	0.45	0.10

Use the table to answer questions 1.1 to 1.5.

1.1. Find P($X > 4$)

A. 0.5

B 0.7

C 0.6

D 0.4

1.2 Find P($X \leq 4$)

A. 0.2

B 0.4

C 0.3

D 0.1

1.3 $X < 2$

A. 0.0

B 0.5

C 0.6

D 0.7

1.4 Consider the claim that the mean weight of airline passengers (including hand luggage) is at most 43 kg per person. Identify the null and alternative hypothesis used to verify this claim.

A. $H_O : \mu = 43\ kg, H_a : \mu. = 43\ kg$

B $H_O : \mu = 43\ kg,\ H_a : \mu \neq 43\ kg$

C $H_O : \mu = 43\ kg,\ H_a : \mu < 43\ kg$

D $H_O : \mu < 43\ kg,\ H_a : \mu. > 43\ kg$

1.5 Assume the claim that the mean weight of airline passengers (including hand luggage) is greater than 43 kg per person. Identify the null and alternative hypothesis used to verify this claim.

A. $H_O : \mu \geq 43\ kg,\ H_a : \mu > 43\ kg$

B $H_O : \mu \geq 43\ kg,\ H_a : \mu < 43\ kg$

C $H_O : \mu \leq 43\ kg,\ H_a : \mu > 43\ kg$

D $H_O : \mu \leq 43\ kg,\ H_a : \mu \geq 43\ kg$

1.6 Assume the claim that the mean weight of airline passengers (including hand luggage) is less than 43 kg per person. Identify the null and alternative hypothesis used to verify this claim.

A. $H_O : \mu < 43\ kg,\ H_a : \mu < 43\ kg$

B $H_O : \mu < 43\ kg,\ H_a : \mu \geq 43\ kg$

C $H_O : \mu > 43\ kg,\ H_a : \mu > 43\ kg$

D $H_O : \mu \geq 43\ kg,\ H_a : \mu < 43\ kg$

1.7 Which of the following distributions is not symmetrical around the mean?

A. t-distribution

B. Normal distribution

C. All of the above

D. Chi-square distribution

1.8 How many per cent under the normal curve lies between $\mu \pm \sigma$

A. 99

B. 68

C. 95

D. 97

1.9 The skewness and kurtosis of a normal probability distribution are.

A. $S = 3; K = 0$

B. $S = 0; K = 3$

C. $S = 0; K = 0$

D. $S = 1; K = 3$

1.10 We committed a type I error, this means we.

A. We did not use the t-table corrected

B. Rejected a true alternative hypothesis

C. Rejected a true null hypothesis

D. Rejected a false hypothesis

Given a sample space $S = \{1, 2, 3, 4, 5, 6\}$, Let $A = \{2, 4, 6\}$ and $B = \{4, 5, 6\}$. Use this to answer questions 1.11 to 1.15.

1.11 Find $A \cap B$.

A. $\{2, 5\}$

B. $\{5, 6\}$

C. $\{2, 6\}$

D. $\{4, 6\}$

1.12 Find $\overline{A} \cap B$

A. 6

B. 2

C. 5

D. 4

1.13 Find $\overline{A}$

A. $\{1, 3, 5\}$

B. $\{2, 3, 5\}$

C. $\{2, 3, 4\}$

D. $\{1, 2, 3\}$

1.14 Find $A \cup B$

A. $\{3, 5, 6\}$

B. $\{2, 5, 6\}$

C. $\{4, 5, 6\}$

D. $\{2, 4, 5, 6\}$

1.15 Find $A \cup \overline{A}$

A. $\{2,4,6\}$

B. $\{1,2,3,4,5,6\}$

C. $\{1,2,3\}$

D. $\{1,2,3,5,6\}$

TRUE OR FALSE QUESTIONS

Indicate whether the following statements are true or false.

1.16 An event that cannot happen has a probability of -1. **True or False**

1.17 The t-distribution has a zero mean and a standard deviation of 1. **True or False**

1.18 The values of a chi-square can be zero or positive but never negative **True or False**

1.19 The mean is sensitive to extreme values (outliers). **True or False.**

1.20 The height of a person is an example of a continuous data. **True or False**

SECTION B

QUESTION 2 (20 Marks)

2.1. For one month, time records show the following results for the number of workers absent per day.

13	14	9	17	21	10	15	22	19	13
22	13	19	23	17	21	10	9	20	18

For the distribution above calculate the following

2.1.1. Arithmetic mean (2 Marks)

2.1.2. Variance (2 Marks)

2.1.3. Standard deviation (2 Marks)

2.1.4. Coefficient of variation (2 Marks)

2.1.5 Range (2 Marks)

2.2. Assume that z-scores are normally distributed with a mean of 0 and standard deviation of 1.

2.2.1. Find a *if* $P(z < a) = 0.9599$ (2 Marks)

2.2.2. Find b *if* $P(z > b) = 0.9772$ (2 Marks)

2.2.3. Find c *if* $P(z > c) = 0.0668$ (2 Marks)

2.2.4. Find d *if* $P(-d < z < d) = 0.5878$ 0 (2 Marks)

2.2.5. Find e *if* $P(-e < z < e) = 0.0956$ (2 Marks)

QUESTION 3 (20 Marks)

3.1. Based on the data from the National Health and Nutrition Examination Survey, assume that the weights of men are normally distributed with a mean of 172 pounds and a standard deviation of 29 pounds.

3.1.1. Find the probability that if an individual is randomly selected, his weight will be greater than 175 pounds. (5 Marks)

3.1.2. Find the probability that 20 randomly selected men will have a mean weight that is greater than

175 pounds (so that their total weight exceeds the safe capacity of 3500 pounds). (5 Marks)

3.2. In 15 days, the sale of bread averaged 74 loaves with a sample standard deviation of 4 loaves. What is the probability of obtaining such a sale given that the average sale is 70 loaves a day? (5 Marks)

3.3 In studying the distribution of data we commonly use the normal distribution. State the properties of a normal distribution. (5 Marks)

QUESTION 4 (20 Marks)

4.1. A sample of 30 employees from large companies was selected, and these employees were asked how stressful their jobs were. The responses of these employees are recorded below.

somewhat	none	somewhat	very	very	none
very	somewhat	somewhat	very	somewhat	somewhat
very	somewhat	none	very	none	somewhat
somewhat	very	somewhat	somewhat	very	none
somewhat	very	very	somewhat	none	somewhat

Note: Very means very stressful, **somewhat** means somewhat stressful, and **None** means not stressful at all.

4.1.1 Prepare a frequency distribution table. (2 Marks)

4.1.2. Calculate the relative frequencies. (2 Marks)

4.1.3. Calculate the cumulative frequencies. (2 Marks)

4.1.4. Calculate relative frequency percentages for all categories. (2 Marks)

4.1.5. Calculate the cumulative frequency percentages for all categories. (2 Marks)

4.2.

Suppose that there were 120 students in the classroom and that they could be classified as follows:

	Hair colour		
Gender	Brown	Not Brown	Total
Male	20		60
Female		30	
Total	50		120

Let

A: {student has brown hair}

A^C: {student has no brown hair}

B: {student is female}

C: {student is male}

Find:

4.2.1. P(A) (2 Marks)

4.2.2. $P(A \cap B)$ (2 Marks)

4.2.3. $P(A \cup B)$ (2 Marks)

4.2.4. $P(B \cap C)$ (2 Marks)

4.2.5. $P(A^C \cap B)$ (2 Marks)

QUESTION 5 (20 Marks)

5.1. An experiment to determine the level of potency of two pesticide labels was conducted. An analysis of the variance table for the experiment is given below. Calculate the values of the highlighted blocks.

Source of variation	Sum of squares	Degrees of Freedom	Mean square	F-Test
Treatment	60.40	2	C	E
Error	437.60	4	D	

Total	A	B		

(10 Marks)

5.2.

5.2.1 The proper operation of a typical home appliance requires electrical voltage levels that do not vary much. Ten (10) voltage levels are recorded on 10 different days. The 10 values have a mean of 123.53 and a standard deviation of $s = 0.15$ volts. Use the sample data to construct a 95 % confidence interval estimate of the standard deviation of all voltage levels. (8 Marks)

5.2.2. Interpret your result. (2 Marks)

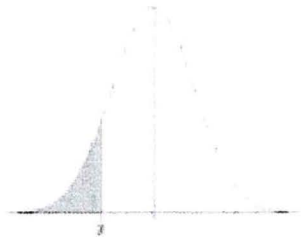
STATISTICAL FORMULA

$$\mu = \frac{\sum x}{N}, \qquad \sigma^2 = \frac{(x-\bar{x})^2}{N-1} \qquad \sigma = \sqrt{\frac{(x-\bar{x})^2}{N-1}}, \qquad \sigma = \sqrt{\frac{(x-\bar{x})^2}{N-1}}$$

$$z = \frac{x-\mu}{\sigma}, \qquad z = \frac{\bar{x}-\mu_{\bar{x}}}{\sigma_{\bar{x}}} = \frac{\bar{x}-\mu_{\bar{x}}}{\frac{\sigma}{\sqrt{n}}}, \qquad z = \frac{\bar{x}-\mu_{\bar{x}}}{\frac{\sigma}{\sqrt{n}}}, \qquad t = \frac{\bar{x}-\mu}{S/\sqrt{n}}$$

$$\sigma^2 = \frac{(x-\bar{x})}{N-1}, \qquad t = \frac{(\bar{x}-\mu)}{S/\sqrt{n}}, \qquad \sigma = \frac{x-\bar{x}}{n-1}, \qquad z = \frac{\bar{x}-\mu}{\sigma}$$

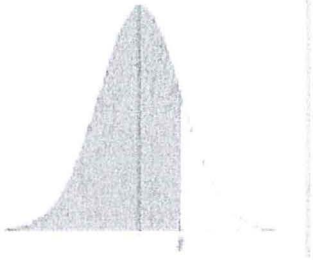
Standard Normal Cumulative Probability Table



Cumulative probabilities for NEGATIVE z-values are shown in the following table:

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-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

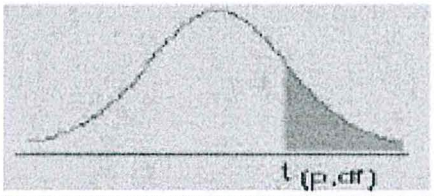
Standard Normal Cumulative Probability Table



Cumulative probabilities for POSITIVE z-values are shown in the following table:

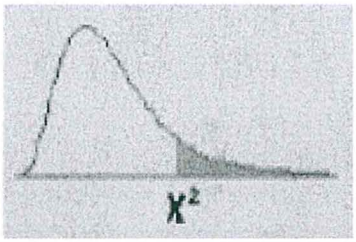
z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	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	0.8485	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	0.9705
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

The t-distribution



df\p	0.40	0.25	0.10	0.05	0.025	0.01	0.005	0.0005
1	0.324920	1.000000	3.077684	6.313752	12.70620	31.82052	63.65674	636.6192
2	0.288675	0.816497	1.885618	2.919986	4.30265	6.96456	9.92484	31.5991
3	0.276671	0.764892	1.637744	2.353363	3.18245	4.54070	5.84091	12.9240
4	0.270722	0.740697	1.533206	2.131847	2.77645	3.74695	4.60409	8.6103
5	0.267181	0.726687	1.475884	2.015048	2.57058	3.36493	4.03214	6.8688
6	0.264835	0.717558	1.439756	1.943180	2.44691	3.14267	3.70743	5.9588
7	0.263167	0.711142	1.414924	1.894579	2.36462	2.99795	3.49948	5.4079
8	0.261921	0.706387	1.396815	1.859548	2.30600	2.89646	3.35539	5.0413
9	0.260955	0.702722	1.383029	1.833113	2.26216	2.82144	3.24984	4.7809
10	0.260185	0.699812	1.372184	1.812461	2.22814	2.76377	3.16927	4.5869
11	0.259556	0.697445	1.363430	1.795885	2.20099	2.71808	3.10581	4.4370
12	0.259033	0.695483	1.356217	1.782288	2.17881	2.68100	3.05454	4.3178
13	0.258591	0.693829	1.350171	1.770933	2.16037	2.65031	3.01228	4.2208
14	0.258213	0.692417	1.345030	1.761310	2.14479	2.62449	2.97684	4.1405
15	0.257885	0.691197	1.340606	1.753050	2.13145	2.60248	2.94671	4.0728
16	0.257599	0.690132	1.336757	1.745884	2.11991	2.58349	2.92078	4.0150
17	0.257347	0.689195	1.333379	1.739607	2.10982	2.56693	2.89823	3.9651
18	0.257123	0.688364	1.330391	1.734064	2.10092	2.55238	2.87844	3.9216
19	0.256923	0.687621	1.327728	1.729133	2.09302	2.53948	2.86093	3.8834
20	0.256743	0.686954	1.325341	1.724718	2.08596	2.52798	2.84534	3.8495
21	0.256580	0.686352	1.323188	1.720743	2.07961	2.51765	2.83136	3.8193
22	0.256432	0.685805	1.321237	1.717144	2.07387	2.50832	2.81876	3.7921
23	0.256297	0.685306	1.319460	1.713872	2.06866	2.49987	2.80734	3.7676
24	0.256173	0.684850	1.317836	1.710882	2.06390	2.49216	2.79694	3.7454
25	0.256060	0.684430	1.316345	1.708141	2.05954	2.48511	2.78744	3.7251
26	0.255955	0.684043	1.314972	1.705618	2.05553	2.47863	2.77871	3.7066
27	0.255858	0.683685	1.313703	1.703288	2.05183	2.47266	2.77068	3.6896
28	0.255768	0.683353	1.312527	1.701131	2.04841	2.46714	2.76326	3.6739
29	0.255684	0.683044	1.311434	1.699127	2.04523	2.46202	2.75639	3.6594
30	0.255605	0.682756	1.310415	1.697261	2.04227	2.45726	2.75000	3.6460
inf	0.253347	0.674490	1.281552	1.644854	1.95996	2.32635	2.57583	3.2905

The Chi-Square Distribution



df\p	.995	.990	.975	.950	.900	.750	.500	.250	.100	.050	.025	.010	.005
1	0.00004	0.00016	0.00098	0.00393	0.01579	0.10153	0.45494	1.32330	2.70554	3.84146	5.02389	6.63490	7.87944
2	0.01003	0.02010	0.05064	0.10259	0.21072	0.57536	1.38629	2.77259	4.60517	5.99146	7.37776	9.21034	10.59663
3	0.07172	0.11483	0.21580	0.35185	0.58437	1.21253	2.36597	4.10834	6.25139	7.81473	9.34840	11.34487	12.83816
4	0.20699	0.29711	0.48442	0.71072	1.06362	1.92256	3.35669	5.38527	7.77944	9.48773	11.14329	13.27670	14.86026
5	0.41174	0.55430	0.83121	1.14548	1.61031	2.67460	4.35146	6.62568	9.23636	11.07050	12.83250	15.08627	16.74960
6	0.67573	0.87209	1.23734	1.63538	2.20413	3.45460	5.34812	7.84080	10.64464	12.59159	14.44938	16.81189	18.54758
7	0.98926	1.23904	1.68987	2.16735	2.83311	4.25485	6.34581	9.03715	12.01704	14.06714	16.01276	18.47531	20.27774
8	1.34441	1.64650	2.17973	2.73264	3.48954	5.07064	7.34412	10.21885	13.36157	15.50731	17.53455	20.09024	21.95495
9	1.73493	2.08790	2.70039	3.32511	4.16816	5.89883	8.34283	11.38875	14.68366	16.91898	19.02277	21.66599	23.58935
10	2.15586	2.55821	3.24697	3.94030	4.86518	6.73720	9.34182	12.54886	15.98718	18.30704	20.48318	23.20925	25.18818
11	2.60322	3.05348	3.81575	4.57481	5.57778	7.58414	10.34100	13.70069	17.27501	19.67514	21.92005	24.72497	26.75685
12	3.07382	3.57057	4.40379	5.22603	6.30380	8.43842	11.34032	14.84540	18.54935	21.02607	23.33666	26.21697	28.29952
13	3.56503	4.10692	5.00875	5.89186	7.04150	9.29907	12.33976	15.98391	19.81193	22.36203	24.73560	27.68825	29.81947
14	4.07467	4.66043	5.62873	6.57063	7.78953	10.16531	13.33927	17.11693	21.06414	23.68479	26.11895	29.14124	31.31935
15	4.60092	5.22935	6.26214	7.26094	8.54676	11.03654	14.33886	18.24509	22.30713	24.99579	27.48839	30.57791	32.80132
16	5.14221	5.81221	6.90766	7.96165	9.31224	11.91222	15.33850	19.36886	23.54183	26.29623	28.84535	31.99993	34.26719
17	5.69722	6.40776	7.56419	8.67176	10.08519	12.79193	16.33818	20.48868	24.76904	27.58711	30.19101	33.40866	35.71847
18	6.26480	7.01491	8.23075	9.39046	10.86494	13.67529	17.33790	21.60489	25.98942	28.86930	31.52638	34.80531	37.15645
19	6.84397	7.63273	8.90652	10.11701	11.65091	14.56200	18.33765	22.71781	27.20357	30.14353	32.85233	36.19087	38.58226
20	7.43384	8.26040	9.59078	10.85081	12.44261	15.45177	19.33743	23.82769	28.41198	31.41043	34.16961	37.56623	39.99685
21	8.03365	8.89720	10.28290	11.59131	13.23960	16.34438	20.33723	24.93478	29.61509	32.67057	35.47888	38.93217	41.40106
22	8.64272	9.54249	10.98232	12.33801	14.04149	17.23962	21.33704	26.03927	30.81328	33.92444	36.78071	40.28936	42.79565
23	9.26042	10.19572	11.68855	13.09051	14.84796	18.13730	22.33688	27.14134	32.00690	35.17246	38.07563	41.63840	44.18128
24	9.88623	10.85636	12.40115	13.84843	15.65868	19.03725	23.33673	28.24115	33.19624	36.41503	39.36408	42.97982	45.55851
25	10.51965	11.52398	13.11972	14.61141	16.47341	19.93934	24.33659	29.33885	34.38159	37.65248	40.64647	44.31410	46.92789
26	11.16024	12.19815	13.84390	15.37916	17.29188	20.84343	25.33646	30.43457	35.56317	38.88514	41.92317	45.64168	48.28988
27	11.80759	12.87850	14.57338	16.15140	18.11390	21.74940	26.33634	31.52841	36.74122	40.11327	43.19451	46.96294	49.64492
28	12.46134	13.56471	15.30786	16.92788	18.93924	22.65716	27.33623	32.62049	37.91592	41.33714	44.46079	48.27824	50.99338
29	13.12115	14.25645	16.04707	17.70837	19.76774	23.56659	28.33613	33.71091	39.08747	42.55697	45.72229	49.58788	52.33562
30	13.78672	14.95346	16.79077	18.49266	20.59923	24.47761	29.33603	34.79974	40.25602	43.77297	46.97924	50.89218	53.67196