Stat 1040:

Quizzes, Spring 2002

Statistics 1040, Sections 002, 003 & 004, Quiz 1 (20 Points)

January 18, 2002

Your Name: _____

Question 1: Observational Studies and Experiments (**10 Points**)

The Public Health Service studied the effects of smoking on health, in a large sample of representative households. For men and for women in each age group, those who had never smoked were on average somewhat healthier than the current smokers, but the current smokers were on average much healthier than those who had recently stopped smoking. Answer the following three questions:

1. Is this an observational study or a contolled experiment? Circle your answer.

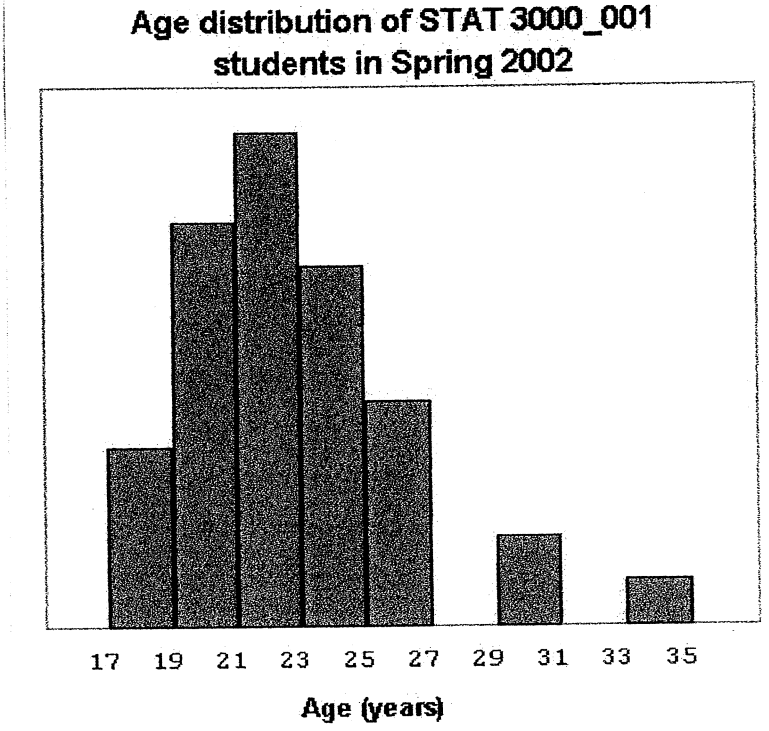
2. Why did they study men and women and the different age groups separately?

3. The lesson seems to be that you shouldn't start smoking, but once you have started, don't stop. Comment briefly.

Please turn over!

Question 2: Histograms **(10 Points)**

The histogram below shows the age distribution of Stat 3000, Section 001, students for the Spring 2002 semester. Unfortunately, the labels on the vertical axis have been deleted. However, the instructor recalls that there have been about 25% of students who were at least 21 but less than 23 years old. Try to help the instructor to fill in some of the missing percentages.



1. What approximate percentage of students were at least 25 but less than 27 years old?

2. What approximate percentage of students were younger than 21 years of age?

Statistics 1040, Sections 002, 003 & 004, Quiz 2 (20 Points)

January 25, 2002

Your Name: _____

Question 1: Measures of Center and Spread (**20 Points**)

Below are the temperatures (in degrees Fahrenheit) for five cities in Alaska on January 4, 2002, as reported in USA Today (see your handouts from the first day of class):

City	Temperature
Anchorage	30
Barrow	-18
Fairbanks	-3
Juneau	36
Nome	0

1. Find the **average temperature** for these cities in Alaska. **Show your work!**

2. Find the **median temperature** for these cities in Alaska.

Please turn over!

3. Find the **standard deviation of the temperatures** for these cities in Alaska. **Show your work!**

Formulas:

$$\text{avg} = \frac{\text{sum of all numbers}}{\text{how many numbers}}$$

$$\text{SD} = \sqrt{\text{average of } [(\text{deviations from avg})^2]}$$

Statistics 1040, Sections 002, 003 & 004, Quiz 3 (20 Points)

February 1, 2002

Your Name: _____

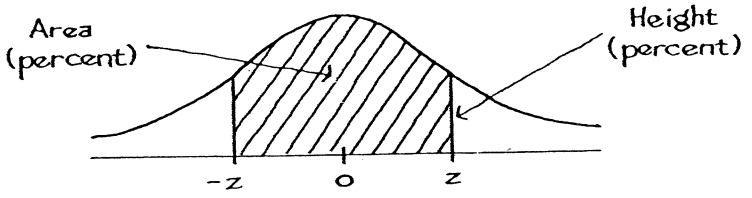
Question 1: Normal Approximation for Data **(20 Points)**

The length of human pregnancies from conception to birth varies according to a distribution that approximately follows the normal curve. The average is 266 days and the standard deviation is 16 days.

What percentage of pregnancies lasts between 242 and 270 days (roughly between 8 and 9 months)?

Show your work!

Tables



A NORMAL TABLE

z	*Area*	*z*	*Area*	*z*	*Area*
0.00	0	1.50	86.64	3.00	99.730
0.05	3.99	1.55	87.89	3.05	99.771
0.10	7.97	1.60	89.04	3.10	99.806
0.15	11.92	1.65	90.11	3.15	99.837
0.20	15.85	1.70	91.09	3.20	99.863
0.25	19.74	1.75	91.99	3.25	99.885
0.30	23.58	1.80	92.81	3.30	99.903
0.35	27.37	1.85	93.57	3.35	99.919
0.40	31.08	1.90	94.26	3.40	99.933
0.45	34.73	1.95	94.88	3.45	99.944
0.50	38.29	2.00	95.45	3.50	99.953
0.55	41.77	2.05	95.96	3.55	99.961
0.60	45.15	2.10	96.43	3.60	99.968
0.65	48.43	2.15	96.84	3.65	99.974
0.70	51.61	2.20	97.22	3.70	99.978
0.75	54.67	2.25	97.56	3.75	99.982
0.80	57.63	2.30	97.86	3.80	99.986
0.85	60.47	2.35	98.12	3.85	99.988
0.90	63.19	2.40	98.36	3.90	99.990
0.95	65.79	2.45	98.57	3.95	99.992
1.00	68.27	2.50	98.76	4.00	99.9937
1.05	70.63	2.55	98.92	4.05	99.9949
1.10	72.87	2.60	99.07	4.10	99.9959
1.15	74.99	2.65	99.20	4.15	99.9967
1.20	76.99	2.70	99.31	4.20	99.9973
1.25	78.87	2.75	99.40	4.25	99.9979
1.30	80.64	2.80	99.49	4.30	99.9983
1.35	82.30	2.85	99.56	4.35	99.9986
1.40	83.85	2.90	99.63	4.40	99.9989
1.45	85.29	2.95	99.68	4.45	99.9991

Statistics 1040, Sections 002, 003 & 004, Quiz 4 (20 Points)

February 8, 2002

Your Name: _____

Question 1: Percentiles and the Normal Curve **(12 Points)**

Among freshmen at a certain university, scores on the Math SAT followed the normal curve, with an average of 500 and an SD of 100. Fill in the blanks. **Show your work!**

1. A student who scored 350 on the Math SAT was at the _____ th percentile of the score distribution.

2. To be at the 75th percentile of the distribution, a student needed a score of about _____ points on the Math SAT.

Question 2: Correlation **(8 Points)**

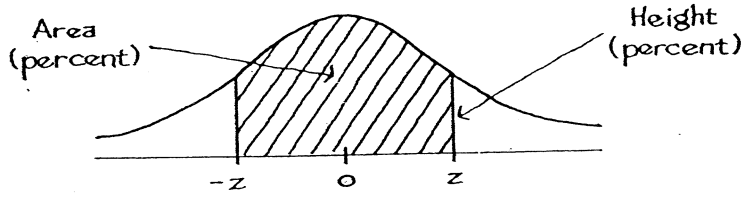
Investigators are studying registered students at a university. The students fill out questionnaires giving their year of birth, age (in years), age of mother, and so forth. Fill in the blanks, using the options given below, and **explain briefly.**

1. The correlation between student's age and year of birth is _____.

2. The correlation between student's age and mother's age is _____.

Options: (a) -1 (b) nearly -1 (c) somewhat negative (d) 0
(e) somewhat positive (f) nearly 1 (g) 1

Tables



A NORMAL TABLE

z	*Area*	*z*	*Area*	*z*	*Area*
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1.40	83.85	2.90	99.63	4.40	99.9989
1.45	85.29	2.95	99.68	4.45	99.9991

Statistics 1040, Sections 002, 003 & 004, Quiz 5 (20 Points)

March 1, 2002

Your Name: _____

Question 1: The Regression Line (**20 Points**)

For the men of age 18 to 24 years in the HANES sample, the relationship between height and systolic blood pressure can be summarized as follows:

	Average	SD
Height	70"	3"
Blood pressure	124mm	15mm

The correlation coefficient r is -0.2 and we can assume that the scatterplot is football-shaped.

1. Find the regression equation for predicting blood pressure from height. (10 Points)

2. Use the regression equation from part 1. to predict the average blood pressure of men who were 6ft tall (note: 1ft = 12"). (5 Points)

3. Find the r.m.s. error for predicting blood pressure from height. (5 Points)

Please turn over!

Formulas:

$$\text{r.m.s. error} = \sqrt{1 - r^2} \times \text{SD}_y$$

$$\text{slope} = r \times \frac{\text{SD}_y}{\text{SD}_x}$$

$$\text{intercept} = \text{avg}_y - \text{slope} \times \text{avg}_x$$

Statistics 1040, Sections 002, 003 & 004, Quiz 6 (20 Points)

March 8, 2002

Your Name: _____

Question 1: Chance/Probability (**20 Points**)

1. (**5 Points**) When we roll 2 dice once, what is the probability that their total is 4?

2. (**5 Points**) When we draw 2 cards from a well–shuffled deck of 52 cards without replacement, what is the chance that the first card is a ♡ and the second card is a ♢?

3. (**5 Points**) I roll a die and toss a coin. What is the chance that the die shows "6" and the coin lands on H?

4. (**5 Points**) A coin is tossed six times. Two possible sequences of results are

   (i) H T T H T H (ii) H H H H H H

   (The coin must land on H or T in the order given; H = heads, T = tails).

   Which of the following is correct? Explain:

   (a) Sequence (i) is more likely.

   (b) Sequence (ii) is more likely.

   (c) Both sequences are equally likely.

Statistics 1040, Sections 002, 003 & 004, Quiz 7 (20 Points)

March 15, 2002

Your Name: _____

Question 1: Box Models, EV, and SE (**16 Points**)

A quiz has 25 multiple choice questions. Each question has 5 possible answers, one of which is correct. A correct answer is worth 4 points, but a point is taken off for each incorrect answer. A student answers all the questions by guessing at random.

1. (**4 Points**) Find the box model.

2. (**6 Points**) Find the expected value, i.e., the number of points a student would get when answering all questions by guessing.

3. (**6 Points**) Find the standard error.

Please turn over!

Question 2: Law of Averages **(4 Points)**

A box contains 10,000 tickets: 4,000 $\boxed{0}$'s and 6,000 $\boxed{1}$'s. And 10,000 draws will be made at random with replacement from this box. Which of the following best describes the situation, and why? **Explain briefly.**

1. The number of 1's will be 6,000 exactly.
2. The number of 1's is very likely to equal 6,000, but there is also some small chance that it will not be equal to 6,000.
3. The number of 1's is likely to be different from 6,000, but the difference is likely to be small compared to 10,000.

Formulas:

$$\text{box average} = \frac{\text{sum of all numbers in box}}{\text{how many numbers in box}}$$

$$\text{box SD} = \sqrt{\text{average of [(deviations from box average)}^2\text{]}}$$

$$\text{EV}_{sum} = \text{number of draws} \times \text{box average}$$

$$\text{SE}_{sum} = \sqrt{\text{number of draws}} \times \text{box SD}$$

Statistics 1040, Sections 002, 003 & 004, Quiz 8 (20 Points)

March 22, 2002

Your Name: _____

Question 1: EV, SE, and Normal Curve (**20 Points**)

According to government data, 21% of American children under the age of six live in households with income less than the official poverty level. A study of learning in early childhood chooses a sample of 300 children.

1. (**4 Points**) Find the box model.

2. (**8 Points**) Find the expected number of children in the sample who come from poverty–level households? And what is the corresponding SE?

3. (**8 Points**) Using the normal curve, find the chance that at least 80 of the children in the sample live in poverty.

Please turn over!

Formulas:

$$\text{box average} = \frac{\text{sum of all numbers in box}}{\text{how many numbers in box}}$$

$$\text{box SD} = \sqrt{\text{average of } [(\text{deviations from box average})^2]}$$

$$\text{EV}_{sum} = \text{number of draws} \times \text{box average}$$

$$\text{SE}_{sum} = \sqrt{\text{number of draws}} \times \text{box SD}$$

Shortcut formulas for a box that contains only *two* different numbers:

$$\text{average} = \frac{(\text{smaller} \times \text{how many}) + (\text{bigger} \times \text{how many})}{\text{how many tickets in the box}}$$

$$\text{SD} = (\text{bigger - smaller}) \times \sqrt{\frac{\text{fraction}}{\text{bigger}} \times \frac{\text{fraction}}{\text{smaller}}}$$

Shortcut formulas for a box that contains only $\boxed{0}$'s and $\boxed{1}$'s:

$$\text{average} = \frac{\text{number of } \boxed{1}\text{'s}}{\text{how many tickets in the box}}$$

$$\text{SD} = \sqrt{\frac{\text{fraction}}{\text{of } \boxed{1}\text{'s}} \times \frac{\text{fraction}}{\text{of } \boxed{0}\text{'s}}}$$

Statistics 1040, Sections 002, 003 & 004, Quiz 9 (20 Points)

April 5, 2002

Your Name: _____

Question 1: $EV_{\%}$, $SE_{\%}$, and Normal Curve **(20 Points)**

A greenhouse has a large number of petunia seedlings of which 25% are purple, the rest white. If I buy 144 of these seedlings, chosen at random, find the chance that I get at least 30% purple ones. **Show your work!**

Please turn over!

Formulas:

$$\text{box average} = \frac{\text{sum of all numbers in box}}{\text{how many numbers in box}}$$

$$\text{box SD} = \sqrt{\text{average of [(deviations from box average)}^2\text{]}}$$

$$\text{EV}_{sum} = \text{number of draws} \times \text{box average}$$

$$\text{SE}_{sum} = \sqrt{\text{number of draws}} \times \text{box SD}$$

Shortcut formulas for a box that contains only *two* different numbers:

$$\text{average} = \frac{(\text{smaller} \times \text{how many}) + (\text{bigger} \times \text{how many})}{\text{how many tickets in the box}}$$

$$\text{SD} = (\text{bigger - smaller}) \times \sqrt{\frac{\text{fraction}}{\text{bigger}} \times \frac{\text{fraction}}{\text{smaller}}}$$

Shortcut formulas for a box that contains only $\boxed{0}$'s and $\boxed{1}$'s:

$$\text{average} = \frac{\text{number of } \boxed{1}\text{'s}}{\text{how many tickets in the box}}$$

$$\text{SD} = \sqrt{\frac{\text{fraction}}{\text{of } \boxed{1}\text{'s}} \times \frac{\text{fraction}}{\text{of } \boxed{0}\text{'s}}}$$

$$\text{EV}_{\%} = \%\text{ of } \boxed{1}\text{'s in the box}$$

$$\text{SE}_{\%} = \frac{\text{SE}_{\text{sum}}}{\#\text{draws}} \times 100\%$$

Statistics 1040, Sections 002, 003 & 004, Quiz 10 (20 Points)

April 12, 2002

Your Name: _____

Question 1: Confidence Intervals for Percentages (**20 Points**)

1) (15 Points) We take a random sample of 500 Cache Valley drivers and find that 346 always wear a seat belt. Find a 95% confidence interval for the percentage of *all* Cache Valley drivers who always wear a seat belt. **Show your work!**

2) (5 Points) Can we do the same calculation as in part 1) if it turns out that 495 out of 500 drivers always wear a seat belt? Yes or no. **Explain!**

Please turn over!

Formulas:

$$\text{box average} = \frac{\text{sum of all numbers in box}}{\text{how many numbers in box}}$$

$$\text{box SD} = \sqrt{\text{average of [(deviations from box average)}^2\text{]}}$$

$$\text{EV}_{sum} = \text{number of draws} \times \text{box average}$$

$$\text{SE}_{sum} = \sqrt{\text{number of draws}} \times \text{box SD}$$

Shortcut formulas for a box that contains only *two* different numbers:

$$\text{average} = \frac{(\text{smaller} \times \text{how many}) + (\text{bigger} \times \text{how many})}{\text{how many tickets in the box}}$$

$$\text{SD} = (\text{bigger - smaller}) \times \sqrt{\frac{\text{fraction}}{\text{bigger}} \times \frac{\text{fraction}}{\text{smaller}}}$$

Shortcut formulas for a box that contains only $\boxed{0}$'s and $\boxed{1}$'s:

$$\text{average} = \frac{\text{number of } \boxed{1}\text{'s}}{\text{how many tickets in the box}}$$

$$\text{SD} = \sqrt{\frac{\text{fraction}}{\text{of } \boxed{1}\text{'s}} \times \frac{\text{fraction}}{\text{of } \boxed{0}\text{'s}}}$$

$$\text{EV}_{\%} = \%\text{ of } \boxed{1}\text{'s in the box}$$

$$\text{SE}_{\%} = \frac{\text{SEsum}}{\#\text{draws}} \times 100\%$$

Statistics 1040, Sections 002, 003 & 004, Quiz 11 (20 Points)

April 19, 2002

Your Name: _____

Question 1: Tests of Significance(**20 Points**)

National data show that on average, college freshmen spend 7.5 hours a week going to parties. One administrator does not believe that these figures apply to her college, which has nearly 3000 freshmen. She takes a simple random sample of 100 freshmen and interviews them. On average, they report 6.6 hours a week going to parties, and the SD is 9 hours. Does it mean that the students from this college really spend less time going to parties than the national average, or is it just a chance variation?

1. (5 points) State the null and the alternative hypothesis for this problem, in words and in terms of the box model.

2. (5 points) Calculate the appropriate test statistic.

3. (5 points) Obtain the P-value (use the normal table on the back).

4. (5 points) State conclusions in terms of rejecting the null hypothesis and in your own words.

Please turn over!

Formulas:

$$\text{box average} = \frac{\text{sum of all numbers in box}}{\text{how many numbers in box}}$$

$$\text{box SD} = \sqrt{\text{average of [(deviations from box average)}^2\text{]}}$$

$$EV_{sum} = \text{number of draws} \times \text{box average}$$

$$SE_{sum} = \sqrt{\text{number of draws}} \times \text{box SD}$$

Shortcut formulas for a box that contains only *two* different numbers:

$$\text{average} = \frac{(\text{smaller} \times \text{how many}) + (\text{bigger} \times \text{how many})}{\text{how many tickets in the box}}$$

$$\text{SD} = (\text{bigger - smaller}) \times \sqrt{\frac{\text{fraction}}{\text{bigger}} \times \frac{\text{fraction}}{\text{smaller}}}$$

Shortcut formulas for a box that contains only $\boxed{0}$'s and $\boxed{1}$'s:

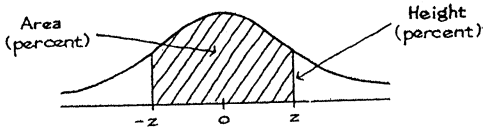
$$\text{average} = \frac{\text{number of } \boxed{1}\text{'s}}{\text{how many tickets in the box}}$$

$$\text{SD} = \sqrt{\frac{\text{fraction}}{\text{of } \boxed{1}\text{'s}} \times \frac{\text{fraction}}{\text{of } \boxed{0}\text{'s}}}$$

$$EV_{\%} = \%\text{ of } \boxed{1}\text{'s in the box}$$

$$SE_{\%} = \frac{SE_{sum}}{\#\text{draws}} \times 100\%$$

Tables



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Statistics 1040, Sections 002, 003 & 004, Quiz 12 (20+ Points)

April 26, 2002

Your Name: _____

You have exactly 15 minutes for this quiz. Each of the three questions is worth 20 points. Choose one question as your "main question" and do it completely. Clearly indicate which question you have chosen. You may also earn extra credit if you manage to work on more than one questions during this time.

Question 1:

(20 Points) The spermicide nonoxynol–9 kills HIV in the test tube, so researchers hypothesized that it might be useful in protecting high–risk women from HIV. Other researchers argued that nonoxynol–9 might increase the risk because it is an irritant. In a study of 990 prostitutes, participants were randomly divided into two groups. The treatment group were given a nonoxynol–9 gel. The control group were given a similar–looking but inactive gel. When the study ended in May 2000, 67 of the 495 women in the treatment group were HIV–positive, and 44 of the 495 women in the control group were HIV–positive. Perform a 2–tailed test to decide whether the treatment and control groups were significantly different with respect to HIV. Clearly state your conclusions.

Question 2:

(20 Points) Reading test scores are known to follow the normal curve. The average reading test score is supposed to be 100. I suspect that the children at one of the local schools have a higher average reading score, so I take a simple random sample of 10 of these children and find that their average reading score is 112, with an SD of 18. Is my suspicion correct? Perform the appropriate statistical test. You must clearly state a null and alternative hypothesis, compute a test statistic and a P-value and state your conclusions.

Question 3:

(20 Points) In the game of chess, the first few moves play a very important role in determining the final outcome. Five different opening strategies are highly favored by chess experts. To determine whether one or more of these strategies is most preferred by grand masters in international competition, a random sample of 100 grand masters is taken, and each is asked which of the strategies he or she would prefer to employ. A summary of their responses is given below:

Strategy	A	B	C	D	E
Frequency	17	27	22	15	19

Make a χ^2–test of the null hypothesis that there is no preference between these strategies by grand masters in international competition. You should state the null and the alternative hypotheses and clearly state your conclusions.

Formulas:

$$\text{box average} = \frac{\text{sum of all numbers in box}}{\text{how many numbers in box}}$$

$$\text{box SD} = \sqrt{\text{average of [(deviations from box average)}^2]}$$

$$\text{EV}_{sum} = \text{number of draws} \times \text{box average}$$

$$\text{SE}_{sum} = \sqrt{\text{number of draws}} \times \text{box SD}$$

$$\text{EV}_{avg} = \text{box average}$$

$$\text{SE}_{avg} = \frac{\text{SE}_{sum}}{\text{number of draws}}$$

$$\text{SD}_{0\text{-}1\text{ box}} = \sqrt{\frac{\text{fraction}}{\text{of } \boxed{1}\text{'s}} \times \frac{\text{fraction}}{\text{of } \boxed{0}\text{'s}}}$$

$$\text{EV}_{\%} = \%\text{ of } \boxed{1}\text{'s in the box}$$

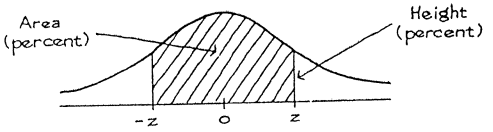
$$\text{SE}_{\%} = \frac{\text{SE sum}}{\text{number of draws}} \times 100\%$$

$$\text{SD}^{+} = \sqrt{\frac{\text{number of draws}}{\text{number of draws} - 1}} \times \text{SD}$$

$$\text{SE}_{\text{diff}} = \sqrt{a^2 + b^2},$$

where a is the SE for the first quantity, b is the SE for the second quantity, and the two quantities are independent

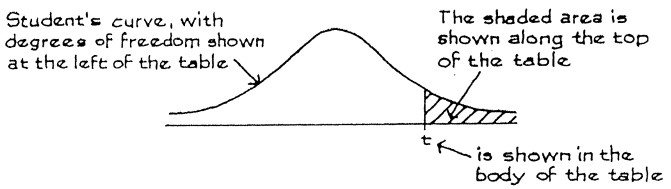
Tables



A NORMAL TABLE

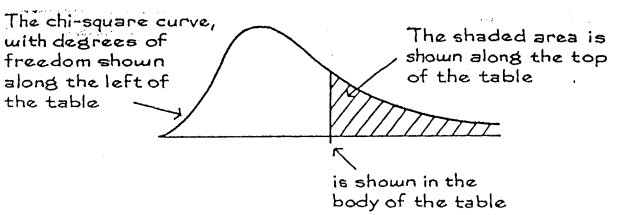
z	Area	z	Area	z	Area
0.00	0	1.50	86.64	3.00	99.730
0.05	3.99	1.55	87.89	3.05	99.771
0.10	7.97	1.60	89.04	3.10	99.806
0.15	11.92	1.65	90.11	3.15	99.837
0.20	15.85	1.70	91.09	3.20	99.863
0.25	19.74	1.75	91.99	3.25	99.885
0.30	23.58	1.80	92.81	3.30	99.903
0.35	27.37	1.85	93.57	3.35	99.919
0.40	31.08	1.90	94.26	3.40	99.933
0.45	34.73	1.95	94.88	3.45	99.944
0.50	38.29	2.00	95.45	3.50	99.953
0.55	41.77	2.05	95.96	3.55	99.961
0.60	45.15	2.10	96.43	3.60	99.968
0.65	48.43	2.15	96.84	3.65	99.974
0.70	51.61	2.20	97.22	3.70	99.978
0.75	54.67	2.25	97.56	3.75	99.982
0.80	57.63	2.30	97.86	3.80	99.986
0.85	60.47	2.35	98.12	3.85	99.988
0.90	63.19	2.40	98.36	3.90	99.990
0.95	65.79	2.45	98.57	3.95	99.992
1.00	68.27	2.50	98.76	4.00	99.9937
1.05	70.63	2.55	98.92	4.05	99.9949
1.10	72.87	2.60	99.07	4.10	99.9959
1.15	74.99	2.65	99.20	4.15	99.9967
1.20	76.99	2.70	99.31	4.20	99.9973
1.25	78.87	2.75	99.40	4.25	99.9979
1.30	80.64	2.80	99.49	4.30	99.9983
1.35	82.30	2.85	99.56	4.35	99.9986
1.40	83.85	2.90	99.63	4.40	99.9989
1.45	85.29	2.95	99.68	4.45	99.9991

A *t*-TABLE



Degrees of freedom	*25%*	*10%*	*5%*	*2.5%*	*1%*	*0.5%*
1	1.00	3.08	6.31	12.71	31.82	63.66
2	0.82	1.89	2.92	4.30	6.96	9.92
3	0.76	1.64	2.35	3.18	4.54	5.84
4	0.74	1.53	2.13	2.78	3.75	4.60
5	0.73	1.48	2.02	2.57	3.36	4.03
6	0.72	1.44	1.94	2.45	3.14	3.71
7	0.71	1.41	1.89	2.36	3.00	3.50
8	0.71	1.40	1.86	2.31	2.90	3.36
9	0.70	1.38	1,83	2.26	2.82	3.25
10	0.70	1.37	1.81	2.23	2.76	3.17
11	0.70	1.36	1.80	2.20	2.72	3.11
12	0.70	1.36	1.78	2.18	2.68	3.05
13	0.69	1.35	1.77	2.16	2.65	3.01
14	0.69	1.35	1.76	2.14	2.62	2.98
15	0.69	1.34	1.75	2.13	2.60	2.95
16	0.69	1.34	1.75	2.12	2.58	2.92
17	0.69	1.33	1.74	2.11	2.57	2.90
18	0.69	1.33	1.73	2.10	2.55	2.88
19	0.69	1.33	1.73	2.09	2.54	2.86
20	0.69	1.33	1.72	2.09	2.53	2.85
21	0.69	1.32	1.72	2.08	2.52	2.83
22	0.69	1.32	1.72	2.07	2.51	2.82
23	0.69	1.32	1.71	2.07	2.50	2.81
24	0.68	1.32	1.71	2.06	2.49	2.80
25	0.68	1.32	1.71	2.06	2.49	2.79

A CHI-SQUARE TABLE



Degrees of freedom	*99%*	*95%*	*90%*	*70%*	*50%*	*30%*	*10%*	*5%*	*1%*
1	0.00016	0.0039	0.016	0.15	0.46	1.07	2.71	3.84	6.64
2	0.020	0.10	0.21	0.71	1.39	2.41	4.60	5.99	9.21
3	0.12	0.35	0.58	1.42	2.37	3.67	6.25	7.82	11.34
4	0.30	0.71	1.06	2.20	3.36	4.88	7.78	9.49	13.28
5	0.55	1.14	1.61	3.00	4.35	6.06	9.24	11.07	15.09
6	0.87	1.64	2.20	3.83	5.35	7.23	10.65	12.59	16.81
7	1.24	2.17	2.83	4.67	6.35	8.38	12.02	14.07	18.48
8	1.65	2.73	3.49	5.53	7.34	9.52	13.36	15.51	20.09
9	2.09	3.33	4.17	6.39	8.34	10.66	14.68	16.92	21.67
10	2.56	3.94	4.86	7.27	9.34	11.78	15.99	18.31	23.21
11	3.05	4.58	5.58	8.15	10.34	12.90	17.28	19.68	24.73
12	3.57	5.23	6.30	9.03	11.34	14.01	18.55	21.03	26.22
13	4.11	5.89	7.04	9.93	12.34	15.12	19.81	22.36	27.69
14	4.66	6.57	7.79	10.82	13.34	16.22	21.06	23.69	29.14
15	5.23	7.26	8.55	11.72	14.34	17.32	22.31	25.00	30.58
16	5.81	7.96	9.31	12.62	15.34	18.42	23.54	26.30	32.00
17	6.41	8.67	10.09	13.53	16.34	19.51	24.77	27.59	33.41
18	7.00	9.39	10.87	14.44	17.34	20.60	25.99	28.87	34.81
19	7.63	10.12	11.65	15.35	18.34	21.69	27.20	30.14	36.19
20	8.26	10.85	12.44	16.27	19.34	22.78	28.41	31.41	37.57

Source: Adapted from p. 112 of Sir R. A. Fisher, *Statistical Methods for Research Workers* (Edinburgh: Oliver & Boyd, 1958).