KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS & STATISTICS
DHAHRAN, SAUDI ARABIA
STAT 211: BUSINESS STATISTICS I
Semester 111
Final Exam
Saturday January 14, 2010
7:00 - 9:40pm

Please **circle** your:
Instructor Name and Section (time)

Mohammad Saleh	3 (9:00 – 9:50)		
Mohammad H. Omar	1 (7:00 – 7:50)	2 (8:00 – 8:50)	6 (11:00 – 11:50)

Name: Student ID#: Serial #:

Directions:

1) Turn off your mobile phones, i-pads, etc. These communication devices are strictly prohibited by the university during exams. Those found with these devices switched on may be subjected to the university cheating policy.
2) You must also put your student ID visibly on your desk so that the proctors may verify your identity.
3) You must **show all work** to obtain full credit for problem solving questions on this exam.
4) **DO NOT round** your answers at each step. Round answers only if necessary at **your final step to 4 decimal places**.

Question No	Full Marks	Marks Obtained
Q1	16	
Q2	16	
Q3	9	
Q4	29	
Total	70	

<u>Question One:</u> (*5+4+7=16 points*)

A survey of a random sample of size 2000 consumers reports 36% expect to have good financial times in the next year.

a) **Find** and **interpret** a 98% confidence interval for the proportion of consumers expecting to have good financial times in the next year.

b) With an error margin of 0.02 and 95% confidence for the proportion of consumers expecting good financial times in the next year, determine **how many** consumers must be sampled.

c) In a random sample of 1300 female consumers, 34% expect to have good financial times in the next year. A random sample of 1500 male consumers shows 40% expecting to have good financial times. **Construct** a 95% confidence interval for the proportion of male versus female consumers expecting to have good financial times in the next year.

Question Two: (5+5+6=*16 points*)

Suppose the amount of an insurance claim has a distribution that may be positively skewed. The insurance company asserts that the population has a mean insurance claim amount of \$400 and a standard deviation of \$1000.

a) For a sample of size 81, describe the sampling distribution of the sample mean. Also, sketch the sampling distribution in graphical form. (Be sure to label your sketch)

b) Find the probability that the sum of 81 such independent insurance claims is greater than \$46620.36.

c) A risk management plan for next year has been planned on the insurance claim amounts of this year. A randomly sample of 81 claim amounts was chosen where the sample mean was \$450. With 95% confidence, do you believe the insurance mean claim amount of \$400 is still correct for the following year? (Support your answer with calculation and statistical reasoning)

Question Three: (*7+2 = 9 points*)

The weight of financial managers in both Riyadh and Dammam has a normal distribution. A random sample of 15 managers in Riyadh and 17 managers in Dammam were selected. The following statistics were computed from the sample data.

	Riyadh	Dammam
Sample mean	125kg	110kg
Sample standard deviation	2.1	1.34

Suppose we are interested in estimating the difference in the mean weight between managers in Riyadh and in Dammam.

a) Use a 0.95 confidence level to **estimate** the mean weight difference. (Be sure to **interpret** your interval)

b) Can you claim that the true population mean difference is 0? (Hint: Support you answer by the confidence interval you just obtained)

Question Four: (*1 point each*)

Answer the following questions by choosing the correct answer. Also, record all your choices in this table

Q1	a	b	c	d	e
Q2	a	b	c	d	e
Q3	a	b	c	d	e
Q4	a	b	c	d	e
Q5	a	b	c	d	e
Q6	a	b	c	d	e
Q7	a	b	c	d	e
Q8	a	b	c	d	e
Q9	a	b	c	d	e
Q10	a	b	c	d	e
Q11	a	b	c	d	e
Q12	a	b	c	d	e
Q13	a	b	c	d	e
Q14	a	b	c	d	e
Q15	a	b	c	d	e
Q16	a	b	c	d	e
Q17	a	b	c	d	e
Q18	a	b	c	d	e
Q19	a	b	c	d	e
Q20	a	b	c	d	e

Q21	a	b	c	d	e
Q22	a	b	c	d	e
Q23	a	b	c	d	e
Q24	a	b	c	d	e
Q25	a	b	c	d	e
Q26	a	b	c	d	e
Q27	a	b	c	d	e
Q28	a	b	c	d	e
Q29	a	b	c	d	e

For the ***first four*** questions below, choose the *best answer* that correctly fills in the blank space.

1. For a symmetric distribution, the mean and median are ______________________.
   a. the same
   b. similar
   c. always different
   d. possibly the same, possibly different
   e. we cannot tell

2. Any characteristic of a population distribution may be properly referred to as a ________.
   a. parameter.
   b. standard deviation.
   c. raw score.
   d. standard score.
   e. statistic.

3. Based on the same data set, a 95% confidence interval for a population mean difference will be ________________ a 99% confidence interval for the same population mean difference.
   a. shorter than
   b. longer than
   c. the same length as
   d. shorter or longer than (depending on the sample data)
   e. we cannot tell

4. A large normally distributed population has mean 16. Consider all samples of size 7. The numbers $\frac{\bar{x}-\mu_x}{s}\sqrt{7}$ are _______
   a. t distributed with 6 degrees of freedom
   b. normally distributed
   c. t distributed with 7 degrees of freedom
   d. neither t nor normal
   e. we cannot tell

5. According to a recent market research survey conducted on behalf of a general insurance group, 20% of males over the age of 30 own a car and a house, 50% own a house and 40% own a car. What is the probability that a man over age 30, chosen at random, owns a house, or a car, or both?
   a. 0.70
   b. 0.50
   c. 0.40
   d. 0.20
   e. 0.90

6. Mr. Ahmad's statistics class had a standard deviation of 2.4 on a standardized test, while Mr. Ali's class had a standard deviation of 1.2 on the same test. Assuming the means are the same, what can be said about these two classes?

    a. Mr. Ali's class is less heterogeneous than Mr. Ahmad's.
    b. Mr. Ahmad's class is more homogeneous than Mr. Ali's.
    c. Mr. Ali's class did less well on the test than Mr. Ahmad's.
    d. Mr. Ahmad's class performed twice as well on the test as Mr. Ali's.
    e. We cannot tell.

7. A large mass of numerical data can best be summarized pictorially by means of which below?

    a. a histogram
    b. the range
    c. the frequency table
    d. the mean and the standard deviation
    e. we cannot tell

8. A company prices its flood insurance using the following operating assumptions:
    i) there can be at most one flood in a calendar year
    ii) the probability of a flood in any year is 0.05
    iii) the number of floods in a year is independent of the number of floods in any other calendar year.

    Using the company's assumptions, what is the probability that *fewer than 3* floods occur in a 20-year period?

    a. 0.92452
    b. 0.98410
    c. 0.05958
    d. 0.07548
    e. None of the above

9. What is the **major advantage** of a probability sample compared to a non-probability sample?

    a. representative samples can be obtained
    b. it prevents destructive sampling
    c. it saves time
    d. it costs less
    e. we cannot tell

10. For a daytime house-to-house survey to study women's attitudes about their role in society, which one of the following errors would be **most likely** to occur?

    a. Non-response
    b. Reporting and processing errors
    c. Interviewer contamination
    d. False information by the respondents
    e. Sampling error

For the next three questions, consider the following data:

1, 7, 3, 3, 6, 4

11. What are the **mean** and the **median** for this data?

a. 4 and 3.5
b. 3 and 4
c. 3.5 and 6
d. 6 and 3.5
e. 3 and 3.5

12. Which below describes the **shape** of the distribution for this data?

a. positively skewed
b. negatively skewed
c. not skewed
d. symmetrical
e. bimodal skewed right.

13. What approximately is the **standard deviation** for this data?

a. 2.19
b. 2
c. 4
d. 4.80
e. 120

14. Find the **mean** of the following sample from the choices below.

X	Frequency of X
2	1
3	2
4	3

a. 3.33
b. 3
c. 2
d. 4
e. 20

15. Which of the following **correctly describes** the features of a simple random sampling method?

a. Each item in the population has an equal chance of being chosen.
b. You decide on a sample size and sample proportionately from the population.
c. You choose each item with no regard to previous choices.
d. All of the above are true.
e. None of the above is true.

16. A sample of size 16 is taken from a normal population with unknown variance. Then a 99% confidence interval is set up with mean 30 and standard deviation 20. Which below is the **table value** you would find to complete calculation of the interval?

    a. 2.947.
    b. 2.602.
    c. 2.326.
    d. 2.921.
    e. 2.575.

17. Suppose we have a population of percentages of fat in 1 pound packages of beef-burger. Suppose these percentages are normally distributed with mean 28 and standard deviation 4. Which below is closest to the **probability** that the mean percentage of a sample of 16 packages is between 26.5 and 29.5 ounces?

    a. 0.866
    b. 0.296
    c. 0.134
    d. 0.704
    e. 0.067

18. Among 25 products, 6 have only minor defects and 3 have major defects. Which of the following is the probability that a product selected at random has **major defects** given that it has defects?

    a. 0.33
    b. 0.36
    c. 0.12
    d. 0.67
    e. 0

19. One hundred students took a test on which the mean score was 73 with a variance of 64. A grade of A was given to all who scored 85 or better. Assuming scores were normally distributed, approximately **how many** A's were there? (Choose the closest.)

    a. 7
    b. 42
    c. 58
    d. 0
    e. 93

20. For a 90% confidence estimate of the population mean with an error of at most 0.4 and population standard deviation of 1.8, which of the following is the correct **minimum sample size** to choose?

    a. 55
    b. 54.80
    c. 54
    d. 8
    e. 7

21. If a sample of 15 is taken from a population with variance 6, which of the following assumption must be *true* to correctly construct a population mean confidence interval?

   a. The population must be normal
   b. $n\pi \geq 5$, and $n(1-\pi) \geq 5$.
   c. The sample size must be large.
   d. The population mean must be known.
   e. We cannot tell, we need more information.

22. The beginning salaries of finance graduates are rounded to the nearest cents. Which of the following determine the **measurement** level and the **data type** for the beginning salaries?

   a. Ratio, Continuous
   b. Nominal, Discrete
   c. Ordinal, Continuous
   d. Ratio, Discrete
   e. Interval, Discrete

The <u>next two</u> questions refer to the problem below.

A study was recently done in which 500 people were asked to indicate their preferences for one of three work environments. The following table shows the breakdown of the responses by gender of the respondents

Gender	Work Environment Preference		
	Government	Private Sector	Self Employment
Male	80	20	10
Female	200	70	120

23. If you were to represent the data in the table above, which graph is the most suitable?

   a. Side-by-side bar chart
   b. Relative frequency ogive
   c. histogram
   d. stem-and-leaf plot
   e. box plot

24. Given that the selected person is male, what approximately is the probability that he prefers self employment?

   a. 0.091
   b. 0.182
   c. 0.020
   d. 0.077
   e. None of the above

25. During the busiest time of the day, customers arrive at the Le Café coffee shop on the average of 1.5 per 20-minute period. What is the probability that the time to a customer arrival is less than 3 minutes?
    a. 0.2015
    b. 0.7985
    c. 0.9889
    d. 0.1797
    e. 0.1255

26. The time to build a laser printer is uniformly distributed between 5 and 9 hours. What is the probability that it will take more than 7.5 hours to build a laser printer?
    a. 0.3750
    b. 0.6250
    c. 0.1667
    d. 0.5000
    e. 0.8333

27. Enjaz bank processes an average of 3 electronic transfers per minute. For the next 2 minutes, what is the probability that there will be 1 or fewer electronic transfers processed?
    a. 0.01735
    b. 0.01487
    c. 0.00248
    d. 0.19915
    e. 0.04979

28. A multinational company has 11 branches. Seven branches are domestic and 4 are outside the kingdom. Each year a performance evaluation is conducted for 3 randomly selected branches. What is the probability that the evaluation will include at least one branch outside the kingdom?
    a. 0.7879
    b. 0.2788
    c. 0.7212
    d. 0.2121
    e. None of the above

29. Of the claims on a motor insurance from *urban* dwelling policyholders, 90% are from *within-city* incidents and 10% are from *out-of-city* incidents. Similarly for *non-urban* dwelling policyholders, the corresponding figures are: 15% *within-city* incidents and 85% *out-of-city* incidents. It is known that 80% of the insurance policyholders are urban dwellers. An insurance claim is received for an out-of-city incident. What is the **probability** that the policyholder is an *urban dweller*?
    a. 0.32
    b. 0.10
    c. 0.68
    d. 0.80
    e. 0.96

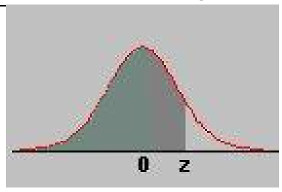
Some Useful Formulas

- *W =(max-min)/(# classes)*
- $\bar{x} = \frac{1}{n}\sum x$
- $R_\alpha = \frac{\alpha}{100}(n+1) = i + d, \quad \alpha = 1,....,99; \quad P_\alpha = (1-d)x_{(i)} + dx_{(i+1)}$
- $S = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}} = \sqrt{\frac{\sum x^2 - (\sum x)^2/n}{n-1}}$
- $Z = \frac{X-\mu_x}{\sigma_x}$ $\qquad CV = \frac{s}{\bar{x}} * 100\%$
- $f(x) = \begin{cases} \frac{1}{b-a} & if \ a \le x \le b \\ 0 & otherwise \end{cases}$,

  $a \le c < d \le b \rightarrow P(c \le X \le d) = (d-c)f(x)$
- $P(0 \le x \le a) = \int_0^a \lambda e^{-\lambda x} dx = 1 - e^{-\lambda a}$
- $\mu_{\bar{x}} = \mu_x, \quad \sigma_{\bar{x}} = \frac{\sigma_x}{\sqrt{n}}, \quad Z = \frac{\bar{X}-\mu_x}{\sigma_x/\sqrt{n}}$
- **$P(A \text{ or } B) = P(A \cup B) = P(A) + P(B) - P(A \cap B)$**
- **$P(A \cap B') = P(A) - P(A \cap B)$**
- $P(A|B) = \frac{P(A \cap B)}{P(B)}, P(B) > 0$
- **$P(A \cap B) = P(A) \times P(B|A) = P(B) \times P(A|B)$**
- $P(B_j|A) = \frac{P(B_j \cap A)}{P(A)} = \frac{P(A|B_j)P(B_j)}{\sum_{i=1}^{k} P(A|B_i)P(B_i)}$ for $j = 1,2,...,k$
- $P(x) = \frac{n!}{x!(n-x)!}\pi^x(1-\pi^x)^{n-x}$
- $\mu_x = E(X) = n\pi, \quad \sigma_x = \sqrt{n\pi(1-\pi)}$
- $P(x) = \frac{(\lambda t)^x e^{-\lambda t}}{x!}, \quad \mu_x = \lambda t, \ \sigma_x = \sqrt{\lambda t}$
- $P(x) = \frac{C_{n-x}^{N-A} C_x^A}{C_n^N} = \frac{\binom{N-A}{n-x}\binom{A}{x}}{\binom{N}{n}}$
- $\mu_x = E[X] = \sum_{all\ x} x_i P(x_i)$ or $\mu_x = E[X] = \int_{-\infty}^{\infty} xf(x)dx$
- $E[X^2] = \sum_{all\ x} x^2 P(x)$ or $\mu_x = E[X^2] = \int_{-\infty}^{\infty} x^2 f(x)dx$
- $\sigma_x^2 = E[X^2] - \mu_x^2$
- $\sigma_{xy} = \sum_{i=1}^{n}(x_i - E[X])(y_i - E[Y])P(x_i \text{ and } y_j)$
- $\mu_p = \pi, \ \sigma_p = \sqrt{\frac{\pi(1-\pi)}{n}}$,
- $\bar{x} \pm z_{\alpha/2}\frac{\sigma_x}{\sqrt{n}}$
- $\bar{x} \pm t_{\alpha/2,n-1}\frac{s}{\sqrt{n}}$
- $n \ge \frac{z_{\alpha/2}^2 \sigma^2}{e^2} = \left(\frac{z_{\alpha/2}\sigma}{e}\right)^2$
- $p \pm z_{\alpha/2}\sqrt{\frac{p(1-p)}{n}}$
- $n \ge \frac{z_{\alpha/2}^2 p(1-p)}{e^2}$
- $(\bar{x}_1 - \bar{x}_2) \pm z_{\alpha/2}\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$
- $(\bar{x}_1 - \bar{x}_2) \pm z_{\alpha/2}\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$
- $(\bar{x}_1 - \bar{x}_2) \pm t_{\alpha/2,n_1+n_2-2} \ s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}$,

  where $s_p = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}}$
- $\bar{d} \pm t_{\alpha/2,n-1}\frac{s_d}{\sqrt{n}}$
- $(p_1 - p_2) \pm z_{\alpha/2}\sqrt{\frac{p_1(1-p_1)}{n_1} + \frac{p_2(1-p_2)}{n_2}}$

The cumulative Standard Normal distribution

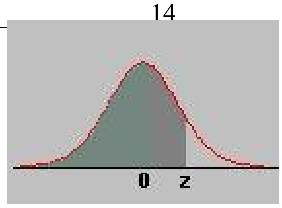


Entry represented area under the cumulative standardized normal distribution from - ∞ to Z

Cumulative Probabilities

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-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**

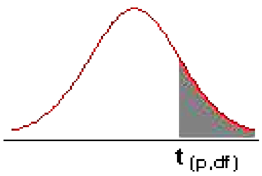
The cumulative Standard Normal distribution



Entry represented area under the cumulative standardized normal distribution from - ∞ to Z

Cumulative Probabilities

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**	**0.9706**
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**



t Table with Right Tail Probabilities

v \ α	**0.4**	**0.25**	**0.1**	**0.05**	**0.025**	**0.01**	**0.005**	**0.0005**
1	0.325	1.000	3.078	6.314	12.706	31.821	63.657	636.62
2	0.289	0.816	1.886	2.920	4.303	6.965	9.925	31.599
3	0.277	0.765	1.638	2.353	3.182	4.541	5.841	12.924
4	0.271	0.741	1.533	2.132	2.776	3.747	4.604	8.610
5	0.267	0.727	1.476	2.015	2.571	3.365	4.032	6.869
6	0.265	0.718	1.440	1.943	2.447	3.143	3.707	5.959
7	0.263	0.711	1.415	1.895	2.365	2.998	3.499	5.408
8	0.262	0.706	1.397	1.860	2.306	2.896	3.355	5.041
9	0.261	0.703	1.383	1.833	2.262	2.821	3.250	4.781
10	0.260	0.700	1.372	1.812	2.228	2.764	3.169	4.587
11	0.260	0.697	1.363	1.796	2.201	2.718	3.106	4.437
12	0.259	0.695	1.356	1.782	2.179	2.681	3.055	4.318
13	0.259	0.694	1.350	1.771	2.160	2.650	3.012	4.221
14	0.258	0.692	1.345	1.761	2.145	2.624	2.977	4.141
15	0.258	0.691	1.341	1.753	2.131	2.602	2.947	4.073
16	0.258	0.690	1.337	1.746	2.120	2.583	2.921	4.015
17	0.257	0.689	1.333	1.740	2.110	2.567	2.898	3.965
18	0.257	0.688	1.330	1.734	2.101	2.552	2.878	3.922
19	0.257	0.688	1.328	1.729	2.093	2.539	2.861	3.883
20	0.257	0.687	1.325	1.725	2.086	2.528	2.845	3.850
21	0.257	0.686	1.323	1.721	2.080	2.518	2.831	3.819
22	0.256	0.686	1.321	1.717	2.074	2.508	2.819	3.792
23	0.256	0.685	1.319	1.714	2.069	2.500	2.807	3.768
24	0.256	0.685	1.318	1.711	2.064	2.492	2.797	3.745
25	0.256	0.684	1.316	1.708	2.060	2.485	2.787	3.725
26	0.256	0.684	1.315	1.706	2.056	2.479	2.779	3.707
27	0.256	0.684	1.314	1.703	2.052	2.473	2.771	3.690
28	0.256	0.683	1.313	1.701	2.048	2.467	2.763	3.674
29	0.256	0.683	1.311	1.699	2.045	2.462	2.756	3.659
30	0.256	0.683	1.310	1.697	2.042	2.457	2.750	3.646
40	0.255	0.681	1.303	1.684	2.021	2.423	2.705	3.551
50	0.255	0.679	1.299	1.676	2.009	2.403	2.678	3.496
60	0.254	0.679	1.296	1.671	2.000	2.390	2.648	3.460
∞	0.253	0.674	1.282	1.645	1.960	2.326	2.576	3.291