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

January 17, 2003

Your Name: _____

Question 1: Observational Studies and Experiments (**14 Points**)

In a recent study on SIDS (Sudden Infant Death Syndrome), one hospital collected data on 128 babies who died from SIDS in the last 12 months. They took a random sample of 500 babies (of similar ages) who did not die from SIDS (the "controls"), and they compared the two groups with respect to several variables of interest (e.g. whether the child slept on his or her stomach, birthweight, time of year, whether the mother smoked, whether she breast–fed, socio–economic status, etc.).

1. (**2 Points**) Is this a controlled experiment or an observational study? Circle your answer and explain.

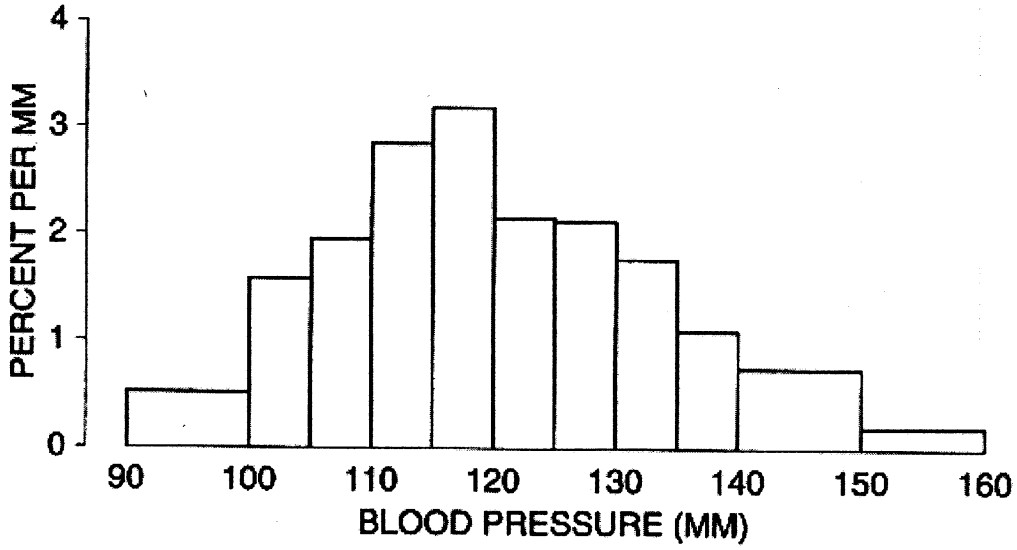
2. (**6 Points**) One physician noticed that 63% of the SIDS babies had mothers who smoked during pregnancy, whereas only 26% of the control babies had mothers who smoked during pregnancy. Another physician claimed that low birthweight could be a "confounding factor". Explain what it means for low birthweight to be a "confounding factor". Be specific.

3. (**6 Points**) If you had access to the data, what would you do to "control for" birthweight?

Please turn over!

Question 2: Histograms (**6 Points**)

The figure below is a histogram showing the distribution of blood pressure for all 14,148 women in a Drug Study (more details about this study can be found in your textbook, page 45).



Use the histogram to answer the following questions:

1. (**2 Points**) Is the percentage of women with blood pressures above 130 mm around 25%, 50%, or 75%?

2. (**2 Points**) Is the percentage of women with bloood pressures between 90 mm and 160 mm around 1%, 50%, or 99%?

3. (**2 Points**) In which interval are there more women: 135–140 mm or 140–150 mm?

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

January 24, 2003

Your Name: _____

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

1. **(10 points)** Find the average and the standard deviation of the following two lists of numbers:

	Numbers	Average	Standard deviation
List 1:	100, 100, 100, 100, 100	_____	_____
List 2:	90, 90, 100, 110, 110	_____	_____

Show your work (or give a short explanation for your answer)! Use the formulas provided on the back.

Please turn over!

2. **(10 points)** Suppose an advertistment reported that the average weight loss after using a certain exercise machine for 2 months was 10 pounds. You investigate further and discover that the median weight loss was 3 pounds.

   (a) Explain whether it is most likely that the histogram of all weight losses has a long right tail, has a long left tail, or is symmetric.

   (b) As a consumer trying to decide whether to buy this exercise machine, would it have been more useful for the *company* to give you the mean (average) or the median? Explain.

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 003 & 004, Quiz 3 (20 Points)

January 31, 2003

Your Name: _____

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

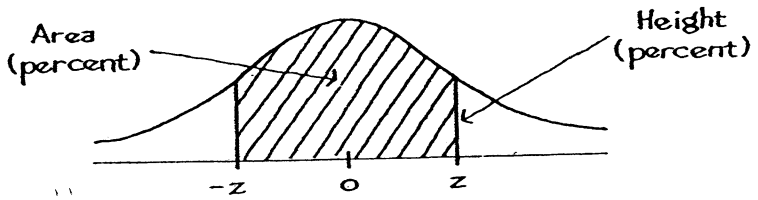
The Wall Street Journal (July 12, 1996) reported that a vacationing family of 4 spends a daily average of $193 for lodging and food, with a standard deviation of $38. Assuming that these expenditures approximately follow a normal curve, answer the questions below:

- The percentage of families who spend **at least $250** on food and lodging is roughly _____ %.

- The percentage of families who spend **between $155 and $231** on food and lodging is about _____ %.

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 003 & 004, Quiz 4 (20 Points)

February 7, 2003

Your Name: _____

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

The Trail Making Test is frequently used by clinical psychologists to test for brain damage. Patients are required to connect consecutively numbered circles on a sheet of paper. It has been determined that the average length of time required for a patient to perform this task is 32 seconds with a standard deviation of 4 seconds. Assume that the lengths of time required to connect the circles closely follow the normal curve.
Fill in the blanks and **show your work!**

1. The proportion of patients who need longer than 40 seconds to perform the task is _____. This also means that 40 seconds is the _____th percentile.

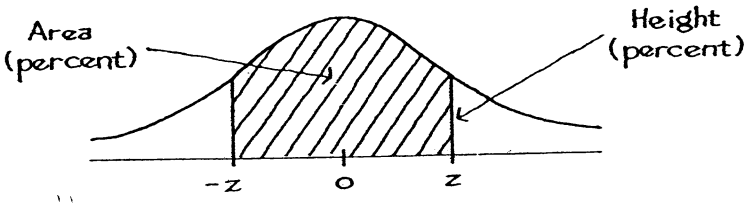
2. A psyhologist would like to retest those persons with completion times in the highest 5% of all required times. Thus, a person who exceeds a time of _____ seconds on the Trail Making Test will be considered for retesting.

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

1. For a representative sample of cars, would the correlation between the age of the car and its gasoline economy (miles per gallon) be positive or negative? Explain!

2. The correlation between gasoline economy and income of owner turns out to be positive. How do you account for this positive association?

Tables



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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
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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 003 & 004, Quiz 5 (20 Points)

February 21, 2003

Your Name: _____

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

A study is made of Math and Verbal SAT scores for the entering class at a certain college. The summary statistics is:

	Average	SD
M–SAT	560	120
V–SAT	520	110

The correlation coefficient r is 0.66 and we can assume that the scatterplot is football–shaped. **Show your work!**

1. (10 Points) Find the regression equation for predicting the V–SAT score from the M–SAT score.

2. (5 Points) If a student scores 680 on the M–SAT, the predicted V–SAT score is _____. (Use the regression equation from part 1!)

3. (5 Points) Find the r.m.s. error for predicting V–SAT scores from M–SAT scores.

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 003 & 004, Quiz 6 (20 Points)

February 28, 2003

Your Name: _____

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

1. In a box of 15 chocolates, 5 are mint, 3 are orange, 4 are caramel, and 3 are cherry. I choose two chocolates at random (without replacement)!

   (a) **(3 Points)** What is the chance that the first is mint or orange?

   (b) **(4 Points)** What is the chance that the first two are both caramel?

   (c) **(4 Points)** What is the chance that the first is cherry and the second is caramel?

   (d) **(4 Points)** If I like only mint, what is the chance that I like neither of the chocolates I choose?

2. **(5 Points)** Two cards will be dealt off the top of a well–shuffled deck. You have a choice:

   (a) To win \$1 if the first is a ♡.

   (b) To win \$1 if the first is a ♡ and the second is a ♢.

   Which option is better? Or are they the same? Explain briefly.

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

March 7, 2003

Your Name: _____

Question 1: Box Models, EV, and SE (**14 Points**)

A quiz has 20 multiple choice questions. Each question has 4 possible answers, one of which is correct. A correct answer is worth 5 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. (**5 Points**) Find the expected value, i.e., the number of points a student would get when answering all questions by guessing.

3. (**5 Points**) Find the standard error.

Please turn over!

Question 2: Law of Averages (**6 Points**)

A box contains red and green marbles; there are more green marbles than red ones. Marbles are drawn one at a time from the box, at random with replacement. You win a dollar if a red marble is drawn more often than a green one. There are two choices:

- A: 50 draws are made from the box.
- B: 500 draws are made from the box.

Choose one of the four options below. **Explain your answer.**

1. A gives a better chance of winning.
2. B gives a better chance of winning.
3. A and B give the same chance of winning.
4. Can't tell without more information.

Formulas:

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

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

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

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

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

March 21, 2003

Your Name: _____

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

In a certain town, there are 40,000 registered voters, of whom 15,000 are Democrats. A survey organization is about to take a simple random sample of 1,000 registered voters. **Show your work!**

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

2. (**8 Points**) The expected number of Democrats in this sample of 1,000 is _____ with an SE of _____.

3. (**8 Points**) The chance that **at least** 500 of the voters in the sample are Democrats is about _____ %.

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 003 & 004, Quiz 9 (20 Points)

April 4, 2003

Your Name: _____

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

A recently conducted survey at the USU has shown that 80% of the approximately 20,000 USU students are satisfied with President Kermit Hall. If we take a random sample of 135 USU students, the chance that at most 70% of them is satisfied with the President is around _____ %.

Show your work!

Please turn over!

Formulas:

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

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

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

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

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

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

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

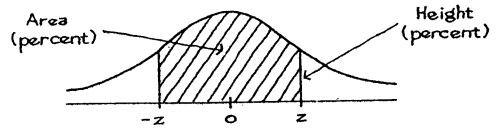
$$\text{average} = \frac{\text{number of } \boxed{1}\text{'s}}{\text{how many tickets in the box}}$$

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

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

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

Tables



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1.45	85.29	2.95	99.68	4.45	99.9991

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

April 11, 2003

Your Name: _____

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

In a school district with 1500 kindergarten children, the heights of 68 randomly chosen children are measured. The average height of these 68 children is 49.7 inches with an SD of 2.7 inches. Suppose that the heights of kindergarten children are known to follow the normal curve.

Show your work!

1. (**12 Points**) If possible, find a 89%-confidence interval for the average height of all 1500 kindergarten children in that school district. If this is not possible, explain why not.

2. (**8 Points**) Approximately 89% of all the kindergarten children in that school district have heights in the interval _____ (which is centered around the average). If it is not possible to determine this interval, explain why not.

Please turn over!

Formulas:

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

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

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

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

$$\text{EV}_{avg} = \text{box average} \qquad \text{SE}_{avg} = \frac{\text{SE}_{sum}}{\text{number of draws}}$$

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

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

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

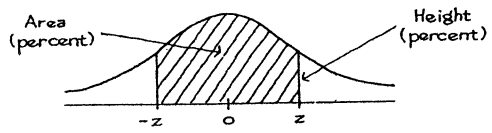
Shortcut formulas for a box that contains only $\boxed{0}$'s and $\boxed{1}$'s:

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

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

$$\text{EV}_{\%} = \%\text{ of } \boxed{1}\text{'s in the box} \qquad \text{SE}_{\%} = \frac{\text{SE}_{sum}}{\text{number of draws}} \times 100\%$$

Tables



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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, Section 003 & 004, Quiz 11 (20 Points)

April 18, 2003

Your Name: _____

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

A high school teacher working at an inner city high school is concerned about the time students spend working after school. She randomly selects 12 of her students and finds the average time spent working after school is 13.1 hours per week, with an SD of 10.5 hours per week.
If the national average is 10.7 hours per week, and assuming that the hours worked follow the normal curve, conduct an appropriate test to see whether this teacher's students work, on average, **longer** than those in the nation as a whole.

1. (3 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 (approximate) P–value (use the appropriate table!).

4. (5 points) State your conclusions in terms of rejecting (or not rejecting) the null hypothesis and in your own words.

5. (2 points) Explain briefly why you chose this particular test to answer the question.

Please turn over!

Formulas:

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

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

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

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

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

$$\text{EV}_{avg} = \text{box average} \qquad \text{SE}_{avg} = \frac{\text{SE}_{sum}}{\text{number of draws}}$$

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

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

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

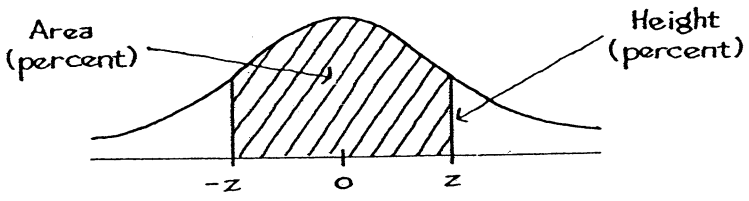
Shortcut formulas for a box that contains only $\boxed{0}$'s and $\boxed{1}$'s:

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

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

$$\text{EV}_{\%} = \%\text{ of } \boxed{1}\text{'s in the box} \qquad \text{SE}_{\%} = \frac{\text{SE}_{sum}}{\text{number of draws}} \times 100\%$$

Tables

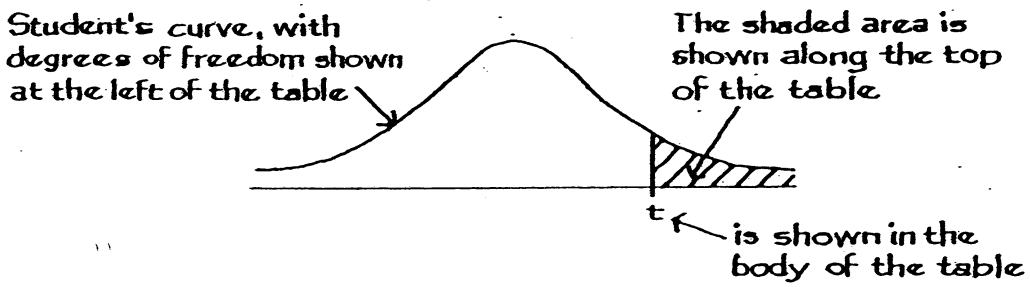


A NORMAL TABLE

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

M0 12/2/02

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

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

April 23–25, 2003

Your Name: _____

This is a take–home quiz. You may work on it at your own pace but you have to complete it and turn it in at the beginning of class on Friday, April 25. If you cannot attend class on Friday, please FAX your answers to (435) 797–1822 **before** class starts. Solutions will be provided in class on Friday and will also be posted to the course Web site on Friday afternoon. Late turn–ins will not be accepted.

This quiz contains three questions, formulated as they may appear in the Final Exam. The first question is worth 20 points. The second and the third questions are extra–credit questions that are optional. These questions are worth 10 extra–points each.

Please work on this quiz independently, using as little help as possible from your friends, books, and notes. To get used to the formula sheet provided in the final, you should look at this sheet only and not at any of our previously used formula sheets. A copy of the formula sheet used in the final has been included on the Study Guide.

Question 1:

(20 Points) *The Wall Street Journal* (June 26, 1996) reported on a study that compared cancer risks for three classes of hypertension drugs. For 4 years the study tracked 750 elderly patients who were being treated for hypertension with either beta blockers, ACE inhibitors, or calcium channel blockers (mainly short–acting form). The table below shows for each treatment the number of patients who developed cancer.

	Class of Hypertension Drugs		
Cancer	Beta Blockers	ACE Inhibitors	Calcium Ch. Blockers
Yes	28	6	27
No	396	118	175

Make an appropriate statistical test to determine whether the data suggest that for elderly patients with hypertension, the risk of developing cancer is related to the class of drugs used. Clearly state the null and the alternative hypotheses and your conclusions.

Question 2:

(10 Points) In a study to estimate the proportion of residents in a certain city and its suburbs who favor the construction of a nuclear power plant, it is found that 63 of 100 urban residents favor the construction whereas only 59 of 110 suburban residents are in favor. Is there a significant difference between the proportions of urban and suburban residents who favor construction of a nuclear plant? Set up a null and an alternative hypothesis, perform an appropriate test, and report your conclusions.

Question 3:

(10 Points) Freshmen at public universities work 12.2 hours a week for pay, on average, and the SD is 10.5 hours; at private universities, the average is 9.2 hours, and the SD is 9.9 hours. Assume these data are based on two independent simple random samples, each of size 1000.
Is the difference between the averages due to chance? If not, what else might explain it? Set up a null and an alternative hypothesis, perform an appropriate test, and clearly state your conclusions.