343 Proficiency Exam Practice Problems

1. On the normal curve find the area

   a) between -.88 and 1.62
   b) to the right of .44

   Find z if the area

   c) to the right is .62
   d) between .0 and z is .2088

2. On the t-curve with 26 degrees of freedom

Find the area
a) to the right of -1.058
b) between 1.706 and 2.479

Find t if the area
c) to the left of t is .0025
d) between -1.315 and t is .895

3. The Wellness Center Poll: WeLikeStudents U built a new Wellness and Exercise Center one year ago on Campus. The university administration wants to know whether the students at their school like the new Wellness Center. The administration sends a letter to all students who live on campus to get their opinion. The letter starts with the following questions: Have you been to our brand new beautiful Wellness Center? Don't you love our new Wellness Center. To reply to the poll students are asked to send the letter back to the President of WeLikeStudents U.

Name any biases in this poll. Give both the statistical names and an English description.

4. A statistics professor is interested in the price of statistics textbooks. In a sample of 20 statistics books the average price was $145 with a standard deviation of $20. Find an 80% t-confidence interval for μ the true average price of a statistics textbook.

4.a) Is $155 too high for the true average price of a statistics textbook? Explain.

5. A loyal McDonald's customer wants to know how many French fries are in a box of Super Sized fries to within 2 fries with 99% probability. If the SD for the number of fries in Super Sized boxes is 9, how many French fry boxes must be checked?

6. A tomato juice manufacturer wants to add spicy tomato juice to the products it sells. To make the juice spicy, it must add precisely one half teaspoon of pepper to a can of tomato juice. If it adds more it will be too spicy and if adds less than one half teaspoon of pepper it will not be spicy enough. The manufacturer has a machine which is known to have a standard deviation of .1 teaspoons for putting in pepper. A sample of 20 cans averages .55 teaspoons of pepper to it. At level of significance .01 has the correct amount of spice been added? Do a One Sample Z-test.

6.a) What is your conclusion in English?

7. The US Chamber of Commerce believes that 30% of Americans like to go to Starbucks. In a random sample of 100 Americans 25 of them like to go to Starbucks. With = .10 is the Chamber of Commerce correct?

Is this a One Sample Z-test, a One Sample t-test, or a One Sample Test for Proportion (= a One Sample Binomial Test? (You do not have to carry out the test.)

8

10. In the northern hemisphere is the correlation between temperature and latitude negative, zero or positive?

11. Find the correlation, the regression line and either the root mean square error or the standard error of estimate for the following pairs of data.

X	*Y*
2	33

12. Multiple regression - see the Excel Printout below:

The following regression was run on consumption of heating oil (in gallons) as a function of average daily temperature and amount of attic installation (in inches).

REGRESSION STATISTICS

Multiple R	.86466
R Square	.74764
Adjusted R Square	.70558
Standard Error	70.469
Observations	15

ANOVA

	df	SS	MS	F	Signif F
Regression	2	176543	88271	17.77	.0003
Residual(Error)	12	59592	4966		

	Coefficient	Std-Err	t Stat	Pvalue
Intercept	563.11	9.11	61.83	.0000
TEMP	-4.51	.89	-5.03	.0003
INSUL	-29.32	6.59	-4.45	.0008

a) What is the regression equation?
b) What is the numerical value of R