**Appendix 11**

**Sample Traditional Math Problems**

1. You are working on a budget for your home expenses. One of the expenses is the monthly electric bill. You have the statements from the previous 12 months, as shown below.

|  |  |
| --- | --- |
| January | $131 |
| February | $128 |
| March | $110 |
| April | $94 |
| May | $93 |
| June | $78 |
| July | $86 |
| August | $99 |
| September | $73 |
| October | $94 |
| November | $108 |
| December | $117 |

a) Compute the mean and standard deviation of the costs.

1. Would it be reasonable to use the mean of the above data to budget the monthly electricity cost for the next year? Explain your answer.

2) A researcher hypothesizes that electrical stimulation will result in a decrease in food intake (in this case, chocolate chips) in rats. Rats undergo surgery where an electrode is implanted. Following a ten day recovery period, rats are tested for the number of chocolate chips consumed during a 10 minute period of time both with and without electrical stimulation. Compute the appropriate t-test for the data provided below.

|  |  |
| --- | --- |
| **Stimulation** | **No Stimulation** |
| 12 | 8 |
| 7 | 7 |
| 3 | 4 |
| 11 | 14 |
| 8 | 6 |
| 5 | 7 |
| 14 | 12 |
| 7 | 5 |
| 9 | 5 |
| 10 | 8 |
| Mean = | Mean = |
| Standard Deviation = | Standard Deviation = |
|  |  |

1. What would be the null hypothesis in this study?
2. What would be the alternate hypothesis?
3. What probability level did you choose and why?

3) You have obtained the number of years of education from one random sample of 38 police officers from City A and the number of years of education from a second random sample of 30 police officers from City B. The average years of education for the sample from City A is 15 years with a standard deviation of 2 years. The average years of education for the sample from City B is 14 years with a standard deviation of 2.5 years. Is there a statistically significant difference between the education levels of police officers in City A and City B?

1. State your null hypothesis.
2. State your alternate hypothesis.
3. Is there a statistically significant difference? Show your work.