Real world examples which appear on exams

Basic Statistics Exam # 3 Name:_____

Directions: Show a complete solution to each problem in the space provided.

(1) Assume that the population of human body temperatures has a mean of 98.6° F, as is commonly believed. Also, assume that the population standard deviation is 0.62° F.

(a) If a sample of size 106 is randomly selected, find the probability that $P(\bar{x} < 98.2°)$.

(b) Based on your answer above, is this event likely to occur?

(c) Since this event did occur, what conclusion would you draw about the belief that $\mu = 98.6°$?

(2) Use the normal distribution to solve the following binomial distribution problem:

Suppose Southwest Airlines have planes that arrive as scheduled 80% of the time. Find the probability that 113 or fewer flights arrive on time among 150 randomly selected flights.

(3) Suppose that a sample of 49 WCC students revealed that their average age was 23.7 years with a standard deviation of 3.45 years. Find a 98% confidence interval for the true mean of the population. Explain the meaning behind your answer.

(4) Suppose that a sample of 25 rare birds show that they lay an average of 21 eggs per month. If the standard deviation of the sample is 2 eggs per month, find the 99% confidence interval for the true mean of the population.

(5) Using the same sample of 25 rare birds cited in problem #4, which lay an average of 21 eggs per month with a standard deviation of 2 eggs per month, construct a 99% confidence interval for the standard deviation of the population. Explain what your answer represents.