In a random sample of 10 cars in a faculty lot at a local community college, it was noted if the car was a hybrid or not. The following is the result:

Hybrid   Not   Not   Not   Not   Not   Not   Not   Not   Hybrid

1.   Give the values for n, p & q for this binomially distributed random variable.

2.   In a sample of 82 faculty cars what is the probability, according to the binomial distribution of finding exactly 8 cars that are hybrid? Use correct notation, show the input into the binomial formula & then give the probability probability and round to 3 significant decimals (if in scientific notation).

3.   In a sample of 82 faculty cars what is the probability, according to the binomial distribution of finding fewer than 8 cars that are hybrid? Use correct notation, show the input into your calculator for giving the probability and round to 3 significant decimals (if in scientific notation).

4.   Ten to twenty years ago, the calculation that you performed in questions 2 and 3 would have been very time consuming or have required the use of a very expensive and large computer. As a result the computations were rarely done

using the binomial distribution. Instead the _____ (fill in the blank) approximation to the binomial was done.

5.   Calculate the mean and standard deviation to be used for this approximation.

6.   Re-compute the probability in #2 using the approximation named in #4. Make sure that you show the continuity correction. Standardization must be used on the continuity corrected random variable to arrive at the final value from which you should calculate a probability.

7.   Re-compute the probability in #3 using the approximation named in #4. Make sure that you show the continuity correction. Standardization must be used on the continuity corrected random variable to arrive at the final value from which you should calculate a probability.

8.   Using the value for p, as computed in question 1, as the point estimate for the population proportion, fill in the blanks for the sampling distribution of p-hats for a sample of 82. We will discuss this in class, but Triola may not discuss this as well as he once did.

   p-hat ~ _____ (_____, _____)

EC   Using the sampling distribution of proportions found in #8, what is the probability of observing more than 30% hybrid vehicles in samples of 82? Correctly write the probability, don't forget continuity correction ($^{0.5}/_n$), show the standardization and then use the correct distribution to find this probability. (If you input the values into your calculator's distributions functions show your input.)

9.   Give a 90% confidence interval for the true proportion of hybrid vehicles found in samples of 82 based on the sampling distribution in #8. You must show a) finding the critical value, b) computation of the margin of error, c) the interval given with the population proportion in the middle of a compound inequality.