**Unit 3 FRQ Describe a Random Sample, Apply results to a population\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

An automobile manufacturer sold 30,000 new cars, one to each of 30,000 customers, in a certain year. The manufacturer was interested in investigating the proportion of the new cars that experienced a mechanical problem within the first 5,000 miles driven.

1. A list of the names and addresses of all customers who bought the new cars is available. Describe a sampling plan that could be used to obtain a simple random sample of 1,000 customers from the list.

Each customer from a simple random sample of 1,000 customers who bought one of the new cars was asked whether they experienced any mechanical problems within the first 5,000 miles driven. Forty customers from the sample reported a problem. Of the 40 customers who reported a problem, 13 customers, or 32.5%, reported a problem specifically with the power door locks.

1. Explain why 0.325 should not be used to estimate the population proportion of the 30,000 new cars sold that experienced a problem with the power door locks within the first 5,000 miles driven.
2. Based on the results of the sample, give a point estimate of the number of new cars sold that experienced a problem with the power door locks within the first 5,000 miles driven.