SG 4.1 AP Statistics Name:

1. For each of the following situations involving sampling, identify—as precisely as possible—the population that the sample represents.

(a) A business school researcher wants to know what factors affect the survival and success of small businesses. She selects a sample of 150 eating-and-drinking establishments from those listed in the telephone directory for a large city.

(b) A member of Congress wants to know whether his constituents support proposed legislation on health care. His staff reports that 228 letters have been received on the subject, of which 193 oppose the legislation.

2. A local radio talk-show host asks viewers to call in and vote for or against a proposed plan to raise the prices charged by municipal parking meters in a downtown shopping district. 75% of the respondents are opposed to the increase. Describe one possible source of error or bias that might arise in this poll and indicate the direction in which the estimate might be biased. What is the name for this kind of bias?

3. Two different organizations conduct polls in a city whose mayor has been accused of taking bribes. One poll asks a SRS of city residents, "Do you think the mayor should resign because of accusations of his criminal activity?" The other asks, "Do you think the mayor should resign?" The first poll concluded that the majority of city residents think the mayor should resign. The second poll drew exactly the opposite conclusion. Explain why their results might be so different.

4. Your school will send a delegation of 35 seniors to a student life convention. 200 girls and 150 boys are eligible to be chosen. If a sample of 20 girls and separate sample 15 boys are each selected randomly, it gives each senior the same chance to be chosen to attend the convention.

(a) Is it an SRS? Explain.

(b) Beginning at line 108 in the random digits table, reproduced below, select the first three senior girls to be in the sample. Explain your procedures clearly.

108	60940	72024	17868	24943	61790	90656	87964	18883
109	36009	19365	15412	39638	85453	46816	83485	41979
110	38448	48789	18338	24697	39364	42006	76688	08708

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1. (a) Population is eating-and-drinking establishments in the large city that advertise in the telephone directory. (b). Population is those constituents who are inclined to write letters to the Congressman (probably a subset of the entire constituent population). **2.** Only those listeners with strong opinions are likely to call in. The poll probably overestimates opposition to the increase. This is bias arising from voluntary response. **3**. The wording of the questions is different enough to produce different responses: mentioning bribery may cause a more negative reaction than not mentioning it, or some subjects might not even know about the accusations. **4.** (a) No. Not every group of 35 seniors is equally likely to be selected. It's impossible, for example, to have a group that is all girls. This is a stratified random sample. (b) Answers may vary. Make sure assigned digits are all the same length and that sampling is done without replacement. If we selected the first three 3-digit numbers between 001 and 200, they will be 179, 090, an 009.