Page 229 #1, 2, 4, 5, 7, 8, 9

1.   population: all local businesses

         sample: the 73 businesses that return he questionnaire

2.   population: all the artifacts discovered at the dig

         sample: those artifacts that are chosen for inspection

4.   population: all 45000 people who made credit card purchases

         sample: the 137 people who returned the survey form

5.   This is a voluntary response sample. In this case, it appears that people who strongly support gun control volunteered more often, causing the proportion in the sample to be greater than the proportion in the population.

7.   This is a voluntary response sample and overrepresents the opinions of those who feel most strongly about the issue being surveyed.

8.   This is a convenience sample. The sample is likely to overestimate the underemployment rate because people without jobs have more time to be at the mall than those who are employed.

9.   **a)**   This is a convenience sample.

         b)   The first 100 students to arrive at school likely had to wake up earlier than the other students, so 7.2 hours is probably less than the true average.

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11.   **a)** Number the 40 students from 01 to 40. Pick a starting point on the random number table. Record two-digit numbers, skipping numbers that aren't in between 01 and 40 and any repeated numbers, until you have 5 unique numbers between 01 and 40. Use the 5 students corresponding to these numbers.

         b) Using line 107: 20 11 38 31 07

12.   **a)** Number the 33 complexes from 01 to 33. Pick a starting point on the random number table. Record two-digit numbers, skipping any that aren't between 01 and 33 and any repeated numbers, until you have 3 unique numbers between 01 and 33. Use the 3 complexes corresponding to these numbers.

         b) Using line 117: 16, 32, 18

13.   **a)** Using a calculator: Number the plots fo 1 to 1410. Use the command randInt(1, 1410) to select 141 different integers from 1 to 1410 and use the corresponding 141 plots.

         b) Answers will vary.

15.   **a)** False – although on average there will be four 0s in every set of 40 digits, the number of 0s can be less than 4 or greater than 4 by chance.

         b) True – there are 100 pairs of digits 00 through 99, and all are equally likely.

         c) False – 0000 is just as likely as any other string of four digits.

18.   **a)** Each tree would need to be identified and numbered, which would take too much time.

   b) This convenience sampling method is biased because trees along the main road are more likely to be damaged by cars and people, and may be more susceptible to infestation.

   c) The percentage is unlikely to be exactly 35% because of sampling variability; however, it should be close to 35%.

19.   Assign numbers 01 to 30 to the students. Pick a starting point on the random digit table. Record two-digit numbers, skipping any that aren't between 01 and 30 and any repeated numbers, until you have 4 unique numbers between 01 and 30. Use the corresponding four students. Then assign numbers 0 to 9 to the faculty members. Continuing on the table, record one-digit numbers, skipping any repeated numbers, until you have 2 unique numbers between 0 and 9. Use the corresponding faculty members. Starting on line 123 gives:

Students:	**Faculty:**
08-Ghosh	1-Besicovitch
15-Jones	0-Andrews
07-Fisher	
27-Shaw	

22.   **a)** Because satisfaction with the property is likely to vary depending on the location of the room, we should stratify by floor and view. Using a stratified random sample would assure the manager that he got opinions from each type of room and provide a more precise estimate of customer satisfaction.

   b) We could use floors as clusters. This would be a simpler option because the manager would only need to survey guests on three floors instead of having to survey guests all over the hotel.

28.   **a)** It is unlikely, because different random samples will include different students and produce different estimates of the proportion of students who use Twitter.

   b) An SRS of 100 students. Larger random samples give us better information about the population than smaller random samples.

32.   The higher no-answer rate was probably the second period – when families are likely to be vacationing or spending time outdoors. A high rate of nonresponse make sample results less reliable because the people away from their phones might answer differently than the people who respond.

35.   **a)** The wording is clear, but the question is slanted in favor of warning labels because of the first sentence stating that some cell phone users have developed brain cancer.

   b) The question is clear, but it is slanted in favor of national health insurance by asserting it would reduce administrative costs and not providing any counter-arguments.

   c) The wording is too technical for many people to understand. For those who do not understand the question, it is slanted because it suggested reasons why one should support recycling.

36.   **a)** The question is clear, but the two options presented are too extreme; no middle position on gun control is allowed. Also, the language used in Option 2 is from the Constitution and people might avoid Option 1 because they don't like the idea of government confiscating personal property.

   b) The question isn't clear. The phrasing of this question will tend to make people respond in favor of a nuclear freeze because only one side of the issue is presented.