2.3 Exercises, page 99

1. (a) cluster random sampling  
   (b) simple random sampling  
   (c) systematic random sampling  
   (d) multi-stage random sampling  
   (e) stratified random sampling  

2. Cluster: Arrange the class in groups of three and randomly select two groups. Stratified: Divide the class into females and males and randomly select 3 students of each gender. Systematic: Randomly pick the first student, then pick every fourth student until you have selected six.

3. (a) Quick and easy, but the sample may not end up representative of the population by chance.  
   (b) Straight forward, but the sample may not end up representative of the population by chance.  
   (c) Each stratum is represented, but the sample may not end up representative of the population by chance.  
   (d) All members of the chosen groups are represented, but not all groups are represented.  
   (e) Higher chance of representation of each group than simple random sampling, but the sample may not end up representative of the population by chance.

4. Answers may vary; for example:  
   (a) 30, 76, 157, 410, 19, 394  
   (b) 3, 44, 85, 126, 167, 208, 249, 290, 331, 372  
   (c) 5, 34, 89, 122, 156, 199, 222, 267, 290, 322, 333, 389  
   (d) 202, 213, 229, 234, 244, 256, 278, 281, 290, 295

5. (a) simple  
   (b) cluster  
   (c) systematic  
   (d) multi-stage  
   (e) stratified

6. (c) Make the males and females into strata and perform a stratified random sample.

7. In stratified random sampling, the population is divided into groups (strata) and a representative simple random sample is taken from each stratum, while a systematic random sample takes every nth individual in the population, where n is the sampling interval. 

8. Choose a random number of classes, then choose a random number of students from each of these classes.

9. Answers may vary; for example:  
   (a) Shuffle the cards and select the first 13 cards in the deck.  
   (b) Shuffle the cards and select every fourth card.  
   (c) Separate the cards into 4 piles by suit. Randomly pick one suit. Take top 3 cards from each pile and one other card.  
   (d) Separate the cards into 4 suits. Randomly pick one suit.  
   (e) Separate the cards into 2 piles of the same colour in each pile. Randomly select 13 cards from one pile.

10. Answers may vary; for example:  
    (a) B774, X315, X322, P035, L506, L501, P032, X320, B777, P039, B771, L507  
    (b) L503, L506, X315, X318, X321, B772, B775, B778, P034, P037  
    (c) L504, L503, L501, X316, X318, X315, B771, B774, B773, P032, P033, P034

11. No, because not every model would be represented.

12. (a) simple random sampling  
    (b) stratified random sampling  
    (c) systematic random sampling or simple random sampling  
    (d) multi-stage random sampling  
    (e) stratified random sampling

13. Quota sampling: Set the number of women, men, high income, medium income, and low income from each state or region. This is not random.

14. The longer the sample is, the more representative of the population it becomes.

2.4 Exercises, page 105

1. (a) What do you think of the quantity of homework assigned so far in the course?  
   (b) Describe your degree of preference to the type of music listed below.  
   (c) What are your plans for post-secondary school?  
   (d) What is your favourite type (genre) of television program?  
   (e) How confident are you in your swimming ability?  

2. (a) Answers may vary; for example:  
   What do you think about the quantity of homework assigned so far in this course?  
   A) too much  B) appropriate  C) not enough  
   D) no opinion  

   (b) Rank the following types of music in order of preference  
   (1 means hate; 5 means love).  

   (c) After high school, I plan to attend: A) college  B) university  
   C) apprenticeship  D) other  

   (d) My favourite type (genre) of television show is A) comedy  
   B) real-life  C) science fiction  D) educational  E) news  

   (e) How confident are you in your swimming ability? A) very  
   B) somewhat  C) a little  D) not at all  E) no opinion

3. (a) What do you think of your timetabled courses this semester?  
   Check all that apply.  
   Q) interesting  Q) challenging  Q) useful  
   (b) Student council will attempt to have the following activities.  
   Rank them from 1 for most important to 5 for least important.  
   ___ more dances  ___ more lunch time sports  
   ___ more assemblies  ___ more university tours

4. (i) (a) (ii) (a) (iii) (c) (iv) (c)  
   (a) (b) (e) (d) (e) (f)

5. Criterion  
   (a) Simple  
   (b) Specific  
   (c) Readable  
   (d) Avoids jargon  
   (e) Avoids abbreviations  
   (f) Avoids negatives  
   (g) Avoids being leading  
   (h) Avoids insensitivity

6. List adjectives that describe the state of the environment.  

What is the extent of pollution in Ontario?  

Avoids insensitivity YYYNNY  

Avoids abbreviations YYNYYY  

Avoids jargon YYYNNN  

Readable NYYYYY  

Specific YYYYYY  

Simple NYYNYY  

Avoids being leading YYYNNY  

Avoids negatives YYYNNY  

Avoids jargon YYNYYY  

Avoids abbreviations YYYNNN  

Avoids being leading YYNYYY  

Avoids negatives YYNYYY  

Avoids jargon NYYYYY  

Specific NYYYYY  

Simple YYYYYY  

Avoids insensitivity YYYNNY  

Avoids abbreviations YYYNNY  

Avoids jargon YYNYYY  

Avoids being leading YYNYYY  

Avoids negatives YYNYYY  

Avoids being leading NYYYYY  

Avoids abbreviations NYYYYY  

Avoids jargon NYYYYY  

Avoids being leading NYYYYY  

Avoids negatives NYYYYY

6. Open questions allow a wide degree of possibilities, which might be difficult to interpret. Closed questions are easy to analyze, but the options may bias the results.