Chapter 14
Extra Practice Questions

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

List the sample space and tell whether the outcomes are equally likely.

1. Toss a coin three times; record the order of heads and tails.

    1. _____

    A. {HHH, HHT, TTH, TTT}, equally likely

    B. {HHH, HHT, HTH, HHT, HTT, THT, TTH, TTT}, equally likely

    C. {HHH, HHT, TTH, TTT}, not equally likely

    D. {HHH, HHT, HTH, HHT, HTT, THT, TTH, TTT}, not equally likely

    E. {H, T}, equally likely

Solve the problem.

2. Of the coffee makers sold in an appliance store, 5.0% have either a faulty switch or a defective cord, 2.7% have a faulty switch, and 0.8% have both defects. What percent of the coffee makers will have a defective cord?

    2. _____

    A. 5.8%   B. 3.5%   C. 5.0%   D. 97.3%   E. 3.1%

Find the indicated probability.

3. You draw a card at random from a standard deck of 52 cards. Find the probability that the card is a spade given that it is not a diamond.

    3. _____

    A. 0.5   B. 0   C. 0.25   D. 0.333   E. 0.077

4. 65% of students at one college drink coffee, and 12% of people who drink coffee suffer from insomnia. What is the probability that a randomly selected student drinks coffee and suffers from insomnia?

    4. _____

    A. 0.572   B. 0.12   C. 0.078   D. 0.692   E. 0.77

5. An IRS auditor randomly selects 3 tax returns from 53 returns of which 12 contain errors. What is the probability that she selects none of those containing errors?

    5. _____

    A. 0.012   B. 0.463   C. 0.009   D. 0.455   E. 0.545

Determine whether the events are independent and give a reason.

6. According to a survey conducted by an environmental organization, the probability that an eligible voter cares about environmental issues is 0.62, the probability that an eligible voter voted in the last election is 0.41 and the probability that an eligible voter both voted in the last election and cares about environmental issues is 0.29. Are caring about environmental issues and voting in the last election independent events?

    6. _____

   A. No, 41% of all voters voted in the last election, but among those who care about environmental issues 46.8% voted in the last election.

   B. Yes, the probability that a voter cares about environmental issues is the same as the probability that a voter cares about environmental issues given that they voted in the last election.

   C. Yes,
P(Cares for environment and Voted) = P(Cares for environment) • P(Voted)

   D. No, 29% both care about environmental issues and voted in the last election

   E. Yes, the probability that a voter cares about environmental issues and voted in the last election is zero.

7. A high school offers these statistics:
21% of incoming students come from single–parent homes
47% of incoming students from single parent homes eventually go on to get a college education.
57% of incoming students from two parent homes eventually go on to get a college education.
Is there any evidence that an incoming student's chances to eventually get a college education depend on whether they come from a single parent or two parent home? Explain.

    7. _____

   A. Yes, the probability of going on to get a college education depends on whether the student comes from a single parent or two parent home.
For students from single parent homes, 47% go on to get a college education.
For students from two parent homes, 57% go on to get a college education.

   B. No, because P(single parent home and college education) = P(single parent home) • P(college education)

   C. No, it is possible for both things to happen
P(single parent home and college education) = (0.21) • (0.47). This is greater than zero.

   D. No, the probability of going on to get a college education does not depend on whether the student comes from a single parent or two parent home.

   E. Yes
P(single parent home and college education) = (0.21) • (0.47)
P(two parent home and college education) = (0.79) • (0.57)
These are not equal

8. The table below describes the smoking habits of a group of asthma sufferers.

	Nonsmoker	Light smoker	Heavy smoker	Total
Men	304	67	88	459
Women	330	89	61	480
Total	634	156	149	939

Is heavy smoking independent of gender?

    A. Yes, a heavy smoker cannot be both a man and a woman.

    B. No,
       P(male and heavy smoker) = 0.094
       P(female and heavy smoker) = 0.065
       These are not equal

    C. Yes, because each of the joint probabilities is equal to the product of the marginal probabilities.

    D. Yes, the percentage of women in each smoking category is the same as the percentage of men in each smoking category.

    E. No, overall 15.9% of the group are heavy smokers , but 19.2% of the men are heavy smokers. These are not equal.

Use a tree diagram to find the indicated probability.

9. Some employers use lie detector tests to screen job applicants. Lie detector tests are not completely reliable. Suppose that a polygraph can detect 65% of lies, but incorrectly identifies 16% of true statements as lies.

A company gives its job applicants a polygraph test, asking "Did you tell the truth on your job application?". All the applicants answer "Yes", but the test identifies some of those answers as lies, thereby causing the person to fail the test.
Suppose that 90% of the job applicants tell the truth during the polygraph test. What is the probability that a person who fails the test was actually telling the truth?

    A. 0.16   B. 0.451   C. 0.9   D. 0.311   E. 0.689

Provide an appropriate response.

10. Five juniors and four seniors have applied for two open student council positions. School administrators have decided to pick the two new members randomly. What is the probability they are both juniors or both seniors?

    A. 0.444   B. 0.569   C. 0.722   D. 0.395   E. 0.506

1. B
2. E
3. D
4. C
5. D
6. A
7. A
8. E
9. E
10. A