Identifying Binomial Distributions. *In Exercises 5–12, determine whether the given procedure results in a binomial distribution (or a distribution that can be treated as binomial). For those that are not binomial, identify at least one requirement that is not satisfied.*

5. Clinical Trial of YSORT The YSORT method of gender selection, developed by the Genetics & IVF Institute, is designed to increase the likelihood that a baby will be a boy. When 291 couples use the YSORT method and give birth to 291 babies, the weights of the babies are recorded.

6. Clinical Trial of YSORT The YSORT method of gender selection, developed by the Genetics & IVF Institute, is designed to increase the likelihood that a baby will be a boy. When 291 couples use the YSORT method and give birth to 291 babies, the genders of the babies are recorded.

7. Veggie Survey In an Idaho Potato Commission survey of 1000 adults, subjects are asked to select their favorite vegetables, and each response was recorded as "potatoes" or "other."

8. Veggie Survey In an Idaho Potato Commission survey of 1000 adults, subjects are asked to select their favorite vegetables, and responses of potatoes, corn, broccoli, tomatoes, or "other" were recorded.

9. Surveying Senators The current Senate consists of 83 males and 17 females. Forty different senators are randomly selected without replacement, and the gender of each selected senator is recorded.

10. Surveying Senators Ten different senators are randomly selected without replacement, and the numbers of terms that they have served are recorded.

11. Smartphone Survey In a RingCentral survey, 380 different smartphone users are randomly selected without replacement. Respondents were asked to identify the only thing that they can't live without. Responses consist of whether a smartphone was identified.

12. Online Shopping In a *Consumer Reports* survey, 427 different women are randomly selected without replacement, and each woman is asked what she purchases online. Responses consist of whether clothing was identified.

13. Guessing Answers The math portion of the ACT test consists of 60 multiple-choice questions, each with five possible answers (a, b, c, d, e), one of which is correct. Assume that you guess the answers to the first three questions.

a. Use the multiplication rule to find the probability that the first two guesses are wrong and the third is correct. That is, find $P(\text{WWC})$, where C denotes a correct answer and W denotes a wrong answer.

b. Beginning with WWC, make a complete list of the different possible arrangements of two wrong answers and one correct answer, then find the probability for each entry in the list.

c. Based on the preceding results, what is the probability of getting exactly one correct answer when three guesses are made?

14. Win 4 Lottery In the New York State Win 4 lottery, you place a bet by selecting four digits. Repetition is allowed, and winning requires that your sequence of four digits matches the four digits that are later drawn. Assume that you place one bet with a sequence of four digits.

a. Use the multiplication rule to find the probability that your first two digits match those drawn and your last two digits do not match those drawn. That is, find $P(\text{MMXX})$, where M denotes a match and X denotes a digit that does not match the winning number.

b. Beginning with MMXX, make a complete list of the different possible arrangements of two matching digits and two digits that do not match, then find the probability for each entry in the list.

c. Based on the preceding results, what is the probability of getting exactly two matching digits when you select four digits for the Win 4 lottery game?