1. MULTI-STEP PROBLEM About 71% of households in Alonso's town have a pet. Alonso is tasked with finding the probability distribution for a survey of 7 random households. Part of his calculation is given:

$$P(k = 3) = {}_7C_3(0.71)^3(0.29)^4 < 0.089$$

   a. Explain what $P(k = 3)$ represents in this calculation.

   b. Explain what ${}_7C_3$ represents in this calculation.

   c. Explain what $(0.71)^3$ represents in this calculation.

   d. Explain what $(0.29)^4$ represents in this calculation.

2. MULTI-STEP PROBLEM According to a survey, 62% of U.S. adults consider themselves sports fans. You randomly select 14 adults to survey.

   a. Draw a histogram of the binomial distribution showing the probability that k adults consider themselves sports fans.

   b. What is the most likely number of adults who consider themselves sports fans?

   c. What is the probability that at least 7 adults consider themselves sports fans?

3. SHORT RESPONSE A community theater is presenting a series of 15 operas this summer. Melinda wants to attend at least 4 of them. Write a subtractive expression using notation representing the number of different combinations of operas she can attend, and then find that number.

4. GRIDDED ANSWER You want to make a fruit smoothie using 3 of the fruits listed. How many different fruit smoothies can you make?

- Orange
- Banana
- Strawberry
- Pineapple
- Canteloupe
- Watermelon
- Kiwi
- Peach

5. GRIDDED ANSWER A softball player gets a hit in about 31% of her at-bats. You randomly select 15 of the player's at-bats. What is the most likely number of hits the player will have in those at bats?

6. SHORT RESPONSE You must take 18 elective courses to meet your graduation requirements for college. There are 30 courses that you are interested in. Does finding the number of possible course selections involve *permutations* or *combinations*? *Explain*. How many different course selections are possible?

7. OPEN-ENDED Give an example of a real-life problem for which the answer is the product of two combinations. Provide a solution.

8. GRIDDED ANSWER An ice cream shop offers a choice of 31 flavors. How many different ice cream cones can be made with three scoops of ice cream if each scoop is a different flavor and the order of the scoops is not important?