CHAPTER 1 Mathematical Processes
1.6 Focus on Reasoning and Proving
Reasoning using Systematic Trial

Example:

a) Juanita visited a farm show, where she saw some people and some cows. Later, she recalled that she had seen a total of 56 eyes and 98 legs. How many of each did she see?

b) What is the next number in this pattern?

12, 9, 3, 6, 3, 1, ...

Solution:

a) Both cows and people have 2 eyes apiece. Therefore, she saw $\frac{56}{2} = 28$ people and cows in total. People have 2 legs, while cows have 4. You need to find numbers that fit the relation $2p + 4c = 96$ and $p + c = 28$ at the same time. Use a graphing calculator or computer software like a spreadsheet to try out different combinations. There were 7 people, and 21 cows.

b) The first five numbers suggest a connection with 3. To get from 12 to 9, subtract 3. To get from 9 to 3, divide by 3. To get from 3 to 6, add 3. Continue the pattern to determine that the next number must be 4.

Practice:

1. Find an anagram (rearrange the letters) in the word ALGEBRA to describe the condition of a chemist whose experiments have all failed.

2. Paolo conjectures that all odd numbers must be prime. What is the smallest counter-example that Ingrid can use to prove him wrong?

Answers:

1. LAB RAGE   **2.** 9