

3.2 Statements & Negations

- ▶ Analyze statements that have the term *all*.
- ▶ Analyze statements that have the term *some* or *many*.
- ▶ Analyze negations of statements.



Study Tip
 Examples of logical terms are: *and, or, not, true, false, if, therefore, every, some, at least one, and all.*

Statements Involving All

Logic is the study of the rules and terms used to make persuasive arguments. A **statement** is a declarative sentence that is either true or false. An **argument** is a string of two or more statements that imply another statement. Here is an example of an argument.

- **Premise:** All types of fruit are food.
- **Premise:** Tomatoes are a type of fruit.
- **Conclusion:** Therefore, tomatoes are food.

In this lesson, you will see how set diagrams can be used to analyze statements. In Section 3.3, you will learn rules for writing logical arguments. Finally, in Section 3.4, you will learn to recognize illogical arguments, which are called fallacies.

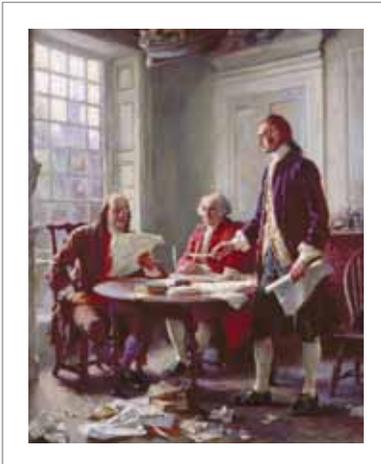
EXAMPLE 1 Analyzing a Statement Involving All

Use a set diagram to analyze the statement taken from the Declaration of Independence.

“We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.”

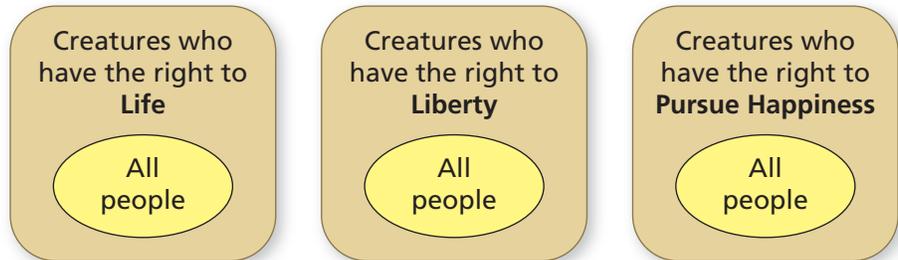
SOLUTION

There are several ways to use set diagrams to analyze this statement. Here are three of them.



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The Declaration of Independence was written primarily by Thomas Jefferson and adopted by the Continental Congress on July 4, 1776. It announced that the 13 American colonies were no longer part of the British Empire. The document uses logic to justify a people’s right to abolish a government that denies them basic human rights.



Notice that the statement says nothing about animal rights. It does leave open the possibility that animals also have such rights.

✓ Checkpoint

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Use a set diagram to analyze the 10th Amendment in the Bill of Rights: “The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.”