

Lesson 12-4

Example 1

Write the negation of the statement two ways.

Statement The garden contains tulips.

Solution

Negation The garden does **not** contain tulips.

Negation **It is not the case that** the garden contains tulips.

Example 2

MUSIC Write the inverse of the statement, and tell whether it is true or false. Explain.

Statement If you play the guitar, then you play a stringed instrument.

Solution

Inverse If you do not play the guitar, then you do not play a stringed instrument.

The original statement is true, but the inverse is false. For example, you might play the violin, which is a stringed instrument, but not play the guitar.

Example 3

Find the contrapositive of each statement. Tell whether each statement and its contrapositive are *true* or *false*. Explain.

- a. *Statement* If a figure is a triangle, then the figure is a polygon.
- b. *Statement* If a figure is a parallelogram, then the figure is a rectangle.

Solution

- a. *Contrapositive* If a figure is not a polygon, then the figure is not a triangle.

The statement is true. A triangle is a type of polygon. The contrapositive is also true. If a figure is not a polygon, then it cannot be a special polygon such as a triangle.

- b. *Contrapositive* If a figure is not a rectangle, then the figure is not a parallelogram.

The statement is false. A figure may be a parallelogram but not necessarily a rectangle. Its contrapositive is also false. A figure may not be a rectangle, but it might be a parallelogram.