The Negation of a Statement
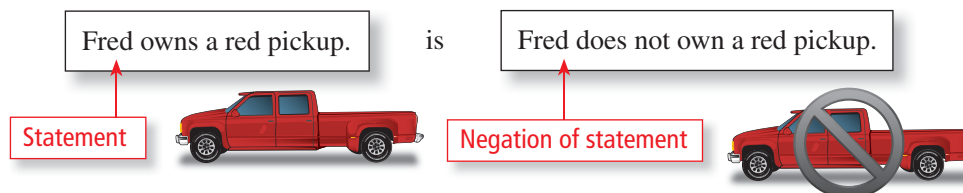
You might think that finding the negation of a statement is simple. Often, this is true. For instance, the negation of

| Fred owns a red pickup. | is | Fred does not own a red pickup. |

Statement

Negation of statement

However, when a statement contains terms such as *and* or *or*, finding the negative can be a bit more challenging. In such cases, a set diagram can help describe the negation.
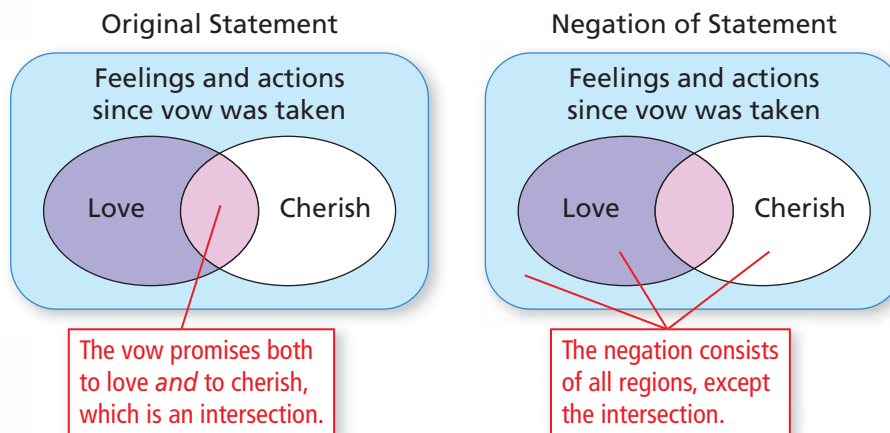
EXAMPLE 5 **Negating a Statement Involving *And***

Use a set diagram to visualize the negation of the "to love and to cherish" portion of this traditional wedding vow.

> I take you to be my wedded spouse. To have and to hold, from this day forward, for better, for worse, for richer, for poorer, in sickness or in health, to love and to cherish until death do us part.

SOLUTION

Start by drawing a set diagram. Identify the regions represented by the original statement. Then identify all the regions other than those represented by the original statement.

Original Statement

Negation of Statement

Feelings and actions since vow was taken

Love   Cherish

Feelings and actions since vow was taken

Love   Cherish

The vow promises both to love *and* to cherish, which is an intersection.

The negation consists of all regions, except the intersection.

So, the vow can be broken in three ways.

- Continue to love, but cease to cherish.
- Continue to cherish, but cease to love.
- Cease loving and cherishing.

✓ **Checkpoint**

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Use a set diagram to visualize the negation of this accusation in the game of CLUE: "It was Miss Scarlet with the wrench in the kitchen." If you are playing the game, how can you prove this accusation to be false?