

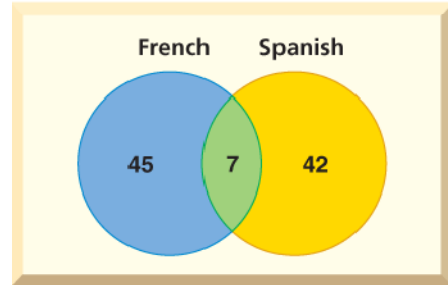
## Lesson 11-4

## Example 1

**CLUBS** Use the Venn diagram.

- How many students belong to the French Club?
- How many belong to the Spanish Club, but not the French Club?
- How many belong to both clubs?
- How many different students belong to these two clubs?

Members of French and Spanish Clubs



## Solution

- Adding  $45 + 7 = 52$ , there are 52 members of the French Club.
- There are 42 members of the Spanish Club who are not members of the French Club.
- There are 7 students who belong to both clubs.
- There are  $45 + 7 + 42 = 94$  different students who belong to one of these clubs or both.

**Example 2**

**FITNESS** A health club surveyed 150 of its members to determine what types of classes they would be interested in taking. The results of the survey are shown in the table.

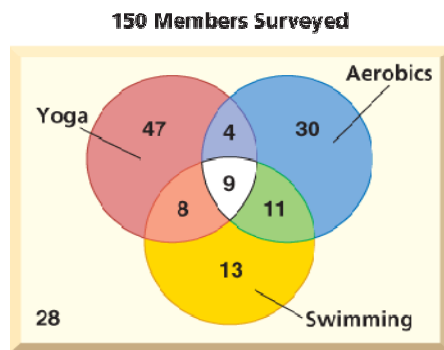
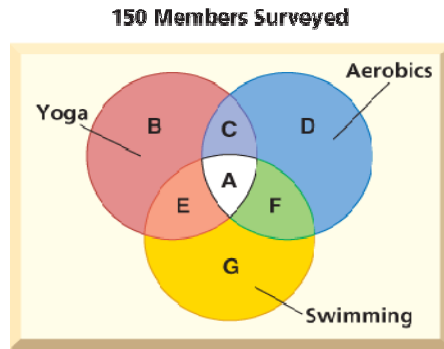
Number of members	Class
68	Yoga
54	Aerobics
41	Swimming
13	Yoga and aerobics
20	Aerobics and swimming
17	Yoga and swimming
9	All three classes

- How many members are interested in yoga or swimming classes?
- How many of the 150 surveyed are not interested in any of the three types of classes?

**Solution**

Make a Venn diagram.

- First put 9 in region A because there are 9 members who expressed interested in all three kinds of classes.
- Since 13 members chose yoga and aerobics (regions A and C together) and region A has 9 members, region C has  $13 - 9 = 4$  members.
- Since 17 members chose yoga and swimming (regions A and E together) and region A has 9 members, region E has  $17 - 9 = 8$  members.
- Since 20 members chose aerobics and swimming (regions A and F together) and region A has 9 members, region F has  $20 - 9 = 11$  members.
- Since 68 members chose yoga (total of regions A, C, E, and B), region B has  $68 - 9 - 4 - 8 = 47$  members.
- Since 54 members chose aerobics (total of regions A, C, D, and F), region D has  $54 - 9 - 4 - 11 = 30$  members.
- Since 41 members chose swimming (total of regions A, E, F, and G), region G has  $41 - 9 - 8 - 11 = 13$  members.
- Since 150 fitness club members were surveyed, the number in the region outside all of the circles is  $150 - (9 + 8 + 4 + 11 + 47 + 30 + 13) = 150 - 122 = 28$  members.



- $47 + 4 + 8 + 9 + 11 + 13 = 92$  members are interested in yoga or swimming classes.
- From the region that is inside the rectangle, but outside of all the circles, 28 members are not interested in yoga, aerobics, or swimming classes.