EXPLORATION 1.2 **Who Owes Whom How Much?**

The Neighbor Problem

This exploration begins with a real-life problem. When I was writing this book, my four-year-old son and our next-door neighbor's four-year-old son went to the same babysitter. At Christmas, the families wanted to do something nice together for the babysitter. My wife bought a gift certificate for $30 for the babysitter and her husband at a local restaurant. Our next-door neighbor bought gifts for both of the babysitter's children; she spent $18 for the gifts. My wife came to me and asked how much our next-door neighbor owed us.

1. Take a few minutes to work on this problem alone. Be prepared to explain your thinking.

2. Compare your answer and your solution path (that is, *how* you solved the problem) with others in your group or others in your class.

The Conference Problem

Now let us make the problem a bit more complex. Sally loaned Leah $10. Leah bought a book for Sally at a conference; the book cost $24. The two went out to dinner. They agreed to split the bill, which came to $40. They found out after the meal that the restaurant didn't accept credit cards. Looking through her wallet, Sally discovered that she only had $11. Leah barely had enough in her wallet, but they made the $40. Who owes whom how much?

3. Take a few minutes to work on this problem alone. Are you inclined to use the same method to solve this problem that you used for the neighbor problem, or are you inclined to use or adapt a method that you heard another student describe? Solve the problem, showing your work.

4. Compare your results with those of other students in your group or your class.

5. If you are satisfied with your answer and your solution path, move on. If you are dissatisfied with either your answer (you now think it's wrong) or your solution path (you find that someone else's method makes more sense or is simpler), do the problem again.

a. If your answer was wrong, describe the source of the error. Describe what problem-solving tools (such as checking your work, asking if what you are writing makes sense, being more systematic, etc.) could have helped you to find your error yourself.

b. If your answer was right, but you like another student's method, explain why that method works. *Note:* This is not the same as showing **what** you did, but rather explaining **why** what you did is correct. It often helps to imagine that you are having to explain the problem to someone who has no idea how to get the answer.

6. Make up a similar problem and solve it.