33. **CLEANING SOLUTIONS** You have a cleaning solution that consists of 2 cups of vinegar and 7 cups of water. You need a cleaning solution that consists of 5 parts water and 1 part vinegar in order to clean windows. How many cups of water do you need to add to your cleaning solution so that you can use it to clean windows?

34. **MULTI-STEP PROBLEM** Working together, a painter and an assistant can paint a certain room in 2 hours. The painter can paint the room alone in half the time it takes the assistant to paint the room alone. Let t represent the time (in hours) that the painter can paint the room alone.

a. Copy and complete the table.

Person	Fraction of room painted each hour	Time (hours)	Fraction of room painted
Painter	$\dfrac{1}{t}$	2	?
Assistant	?	2	?

b. *Explain* why the sum of the expressions in the fourth column of the table must be 1.

c. Write a rational equation that you can use to find the time that the painter takes to paint the room alone. Then solve the equation.

d. How long does the assistant take to paint the room alone?

35. ❧ **TAKS REASONING** You and your sister can rake a neighbor's front lawn together in 30 minutes. Your sister takes 1.5 times as long as you to rake the lawn by herself.

a. **Solve** Write an equation that you can use to find the time t (in minutes) you take to rake the lawn by yourself. Then solve the equation.

b. **Compare** With more experience, both of you can now rake the lawn together in 20 minutes, and your sister can rake the lawn alone in the same amount of time as you. Tell how you would change the equation in part (a) in order to describe this situation. Then solve the equation.

c. **Explain** *Explain* why your solution of the equation in part (b) makes sense. Then justify your explanation algebraically for any given amount of time that both of you rake the lawn together.

36. **TELEVISION** The average time t (in minutes) that a person in the United States watched television per day during the period 1950–2000 can be modeled by

$$t = \frac{265 + 8.85x}{1 + 0.0114x}$$

where x is the number of years since 1950.

a. Approximate the year in which a person watched television for an average of 6 hours per day.

b. About how many years had passed when the average time a person spent watching television per day increased from 5 hours to 7 hours?