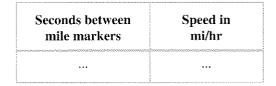You can check the accuracy of a car's speedometer by using a stopwatch and the mile markers on a highway. The driver should maintain a steady speed while a passenger uses a stopwatch to time the travel time between mile markers. This travel time tells you the number of seconds it takes you to go one mile, which you can convert to miles per hour.

1. Convert 0.123 hours to minutes and seconds.

2. Convert 4.567 hours to hours, minutes, and seconds.

3. A car is traveling at 55 miles per hour.
   a. What fraction of an hour does it take to go one mile?
   b. How many minutes and seconds does it take to go one mile?
   c. How many seconds does it take to go one mile?

4. How would you convert
   a. miles per hour to miles per second?
   b. miles per second to miles per hour?
   c. miles per second to seconds to go one mile?
   d. seconds to go one mile to miles per second?

5. If it takes you 65 seconds to go one mile, how many miles per hour are you going? Explain how you figured this out, showing calculations.

6. Describe a general strategy for converting seconds per mile to miles per hour.

7. Make a table like this one to help people check their speedometers.

Seconds between mile markers	Speed in mi/hr
...	...

8. a. Graph the ordered pairs in the table you made.
   b. Let y stand for the speed in mi/hr, and x stand for the number of seconds between markers. Write an equation relating x and y.

Say that the person in charge of timing can be off by one second in starting the stopwatch, and one second in stopping it.

9. What is the maximum error in using the table, resulting from the inaccuracy in timing?

10. If, instead of measuring the time to go one mile, you measure the time to go four miles and use the average one-mile time, what is the maximum error?

11. **Report** Write an explanation for the general public of how to check the accuracy of a speedometer. Include your table, some illustrations, and an explanation of what to do to get an exact answer between values given in the table.