NASCAR Racing Automobile racing is one of the most popular spectator sports in the United States. One of the most important races is the NASCAR Daytona 500, a 500-mile race for cars similar to those driven every day on American streets and highways. The prize for the winner is over $1 million. Winners also get lots of advertising endorsement income.

① The average speed and time of the Daytona 500 winner varies from year to year.

    a. In 1960, Junior Johnson won with an average speed of 125 miles per hour. The next year Marvin Panch won with an average speed of 150 miles per hour. What was the difference in race time between 1960 and 1961 (in hours)?

    b. In 1997, Jeff Gordon won with an average speed of 148 miles per hour. The next year the winner was Dale Earnhardt with an average speed of 173 miles per hour. What was the difference in race time between 1997 and 1998 (in hours)? (Source: www.nascar.com/races/)

② Complete a table like that shown here to display sample pairs of (*average speed, race time*) values for completion of a 500-mile race.

Average Speed (in mph)	50	75	100	125	150	175	200
Race Time (in hours)							

    a. Plot the sample (*average speed, race time*) data on a graph. Describe the relationship between those two variables.

    b. Write a symbolic rule that shows how to calculate *race time t* as a function of *average speed s* in the Daytona 500 race. Show with specific examples that your rule produces correct race time for given average speed.

③ In the 1960–61 and 1997–98 comparisons of winning speed and time for the Daytona 500 race, the differences in average speed are both 25 miles per hour. The time differences are not the same. At first, this might seem like a surprising result.

    How is the fact that equal changes in average speed don't imply equal changes in race time illustrated in the shape of the graph of sample (*average speed, race time*) data?

④ How are the table, graph, and algebraic rule relating *average speed* and *race time* similar to or different from those you have seen in work on earlier problems?