c. Plot the graph of the logistic function for the first three hours.

d. Based on the logistic model, how many students have heard the news at 9:00 a.m. if you heard it at 8:00 a.m.? How long will it be until all but 10 students have heard the news?

4. *Spreading the News Simulation Experiment:* In this experiment you will simulate the spread of the news in Problem 3. Number each student in your class starting at 1. Person 1 stands up and then selects two people at random to "tell" the news to. Do this by selecting two random integers between 1 and the number of students in your class, inclusive. (It is not actually necessary to tell any news!) The random number generator on one student's calculator will help make the random selection. The two people with the chosen numbers stand. Thus after the first iteration there will probably be three students standing (unless a duplicate random number came up). Each of these (three) people selects two more people to "tell" the news to by selecting a total of 6 (or 4?) more random integers. Do this for a total of 10 iterations or until the entire class is standing. At each iteration, record the number of iterations and the total number of people who have heard the news. Describe the results of the experiment. Include such things as

   - The plot of the data points.
   - A function that fits the data, and a graph of this function on the plot. Explain why you chose the function you did.
   - A statement of how well the logistic model fits the data.
   - The iteration number at which the good news was spreading most rapidly.

5. *Ebola Outbreak Epidemic Problem:* In the fall of 2000, an epidemic of the ebola virus broke out in the Gulu district of Uganda. The table shows the total number of people infected from the day the cases were diagnosed as ebola virus infections. The final number of people who got infected during this epidemic is 396. (Ebola is a virus that causes internal bleeding and is fatal in most cases.)

x (days)	y (total infections)
1	71
10	182
15	239
21	281
30	321
50	370
74	394

a. Make a plot of the data points. Imagine a function that fits the data. Is the graph of this function concave upward or downward?

b. Use the second and last points to find the particular equation of a logistic function that fits the data.

c. Plot on the same screen as the plot in part a the logistic function from part b. Sketch the results.

d. Where does the point of inflection occur in the logistic model? What is the real-world meaning of this point?

e. Based on the logistic model, how many people were infected after 40 days?

f. Consult a reference on the Internet or elsewhere to find data about other epidemics. Try to model the spread of the epidemic for which you found data.

A Red Cross medical officer instructs villagers about the ebola virus in Kabede Opong, Uganda.