Chapter 7 Web Task

Figuring Out Exponential Growth

In her Biology class, Anuam was studying bacteria growing. She injected 3000 bacteria into a Petri dish, and measured the number of bacteria several times over the next six hours. Her results are shown in the table.

Time, *t*, (h)	Number of Bacteria, *N*
0	3 000
0.8	5 378
2.2	14 900
3.3	33 300
4.8	99 600
5.4	154 300

Anuam wants to find the doubling time for this type of bacteria. She knows that an equation for exponential growth is $N = N_0 2^{\frac{t}{D}}$ where N_0 is the initial number of bacteria, and D is the doubling time.

a) Add a column to the table. In it, record $\frac{N}{N_0}$ for each value of *t*. Graph $\frac{N}{N_0}$ versus *t*, and estimate the doubling time for this type of bacteria.

b) Use logarithms to calculate a more accurate value for the doubling time. Graph the function on your scatter plot to verify your answer.

c) Use technology to perform an exponential regression of $\frac{N}{N_0}$ versus *t*. Record your results, and explain whether this procedure could help Anuam find the doubling time.