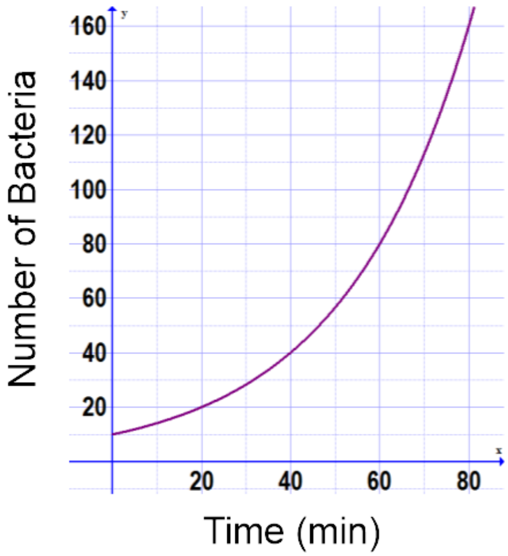
Exponential Models



1. Describe the relationship between number of bacteria and time.

2. Does this relationship appear to be linear, quadratic or neither? Explain.

3. Complete the table of values below and determine the first and second differences.

Time (min)	Number of Bacteria	First Differences	Second Differences
0			
20			
40			
60			
80			

Is this relationship linear, quadratic or neither?

4. Use the table of values above to determine the ratios of the number of bacteria present after each 20 minute period. (Divide successive values)
What happens to the number of bacteria every 20 minutes?

Years	Mass Remaining (µg)	First Differences	Second Differences	Ratios
0	200			
100	170			
200	145			
300	124			
400	105			
500	90			
600	76			
700	65			
800	55			
900	47			
1000	40			

The table above shows the mass of Americium-241 remaining in a smoke detector over time.

1. Describe the relationship between the mass of Americium remaining and time.

2. Verify that the values of the independent variable are equally spaced. Then, determine the first and second differences. Is the relationship linear, quadratic or neither? Explain.

3. Determine the ratios of the values of the dependent variable. Do the ratios imply an exponential relationship? Explain.