Chapter 1.2: Exponential Functions

Calculus I

College of the Atlantic. Fall 2016

Time	Polution
1	32,400
2	19,440
3	11,664
5	4,199

The above table shows amount of smoke particles in the air in a building. Time is measured in hours since a pan of tofu stir-fry caught on fire, and pollution is measured in ppm (parts per million). The smoke decreases due to the building's air filters.

1. What type of function is this? How can you tell?
2. What was the pollution level immediately after the tofu fire?
3. Determine an equation describing this data.
4. Explain the meaning of every symbol in the equation.
5. What was the pollution level 15 minutes after the tofu fire?
6. By what percent does the smoke level change each hour?
7. Use your equation to predict the pollution level one day after the tofu incident.
8. Why do you think the smoke level changes in this way?

Imagine you are writing a Field Guide of Mathematical Functions. What are the "field markings" – i.e., useful identifying characteristics – for exponential functions? (Don't forget to ponder exponential decay.)

1. What does the graph of an exponential function look like?
2. How can you tell if a function is exponential by looking at a table of values?
3. What is the equation for an exponential function?
4. If given a verbal description of a function, how can you tell if it's exponential?

Make rough sketches of the following functions:

1. $f(t) = 10(1.1)^t$
2. $g(t) = 10(0.9)^t$
3. $h(t) = 100(1 - (0.5)^t)$