c. Repeat your investigation for one other exponential function (of the form $= y_0 a^t$) to convince yourself of your conclusions. Write out the example exponential function used and the resulting proportionality relationship. (Include a specific value for the constant of proportionality.)

We can refer to the relationships that you wrote down in #4 above as **rate of change equations.** A rate of change equation expresses how the rate of change of two changing quantities behaves. We can figure out quite a bit about the relationship between two changing quantities (say y and t) by just knowing how their rate of change, $\frac{\Delta y}{\Delta t}$, behaves.

Note that some characteristics of these rate of change equations can depend upon the size of Δt used in calculating rate of change values and whether the rate of change values were associated with the beginning or the end of each interval. For example, the rate of change equation that you developed in #2(b) was a result of having used a $\Delta t = 2$ in your calculations and having associated each rate of change value with the beginning of the interval. When discussing rate of change equations it will be understood that rates of change values are *always* associated with the beginning (not the end) of each interval and that an appropriate choice has been made for the "step size" (Δt) used in developing the rate of change equation.

6. Class Discussion: Describe the behavior of the rate of change of a general exponential function (as discovered in this activity):

    a. Narratively:

    b. Symbolically with a rate of change equation:

    c. Graphically by sketching a graph of the rate of change equation: