9. [14 points] An ice cube melts at a rate proportional to its surface area. Let $V(t)$ denote the volume (in cm^3) of the ice cube, and let $x(t)$ denote the length (in cm) of a side of the ice cube t seconds after it begins to melt.

a. [4 points] Write a differential equation for $V(t)$, the ice cube's volume t seconds after it started melting. Your differential equation may contain V, t and an unknown constant k.

b. [4 points] The ice cube's initial volume is $V_0 > 0$. Solve the differential equation you found in part (a), finding V in terms of t, k, and V_0.

c. [6 points] Graph the volume of the ice cube versus time given $V(0) = V_0$. Be sure to label your axes and any important features of your graph, including the time at which the ice cube has completely melted.