a. Consider a ball *thrown* vertically down from a building at much greater than its terminal velocity (were it to be dropped from rest). The ball is of a size that only the *linear* velocity air resistance term exists, $\vec{F}^{drag} = -c_1\vec{v}$.

Describe the motion of the ball qualitatively (without using mathematics but using any relevant diagrams, pictures, and graphs), in as much detail as possible.

b. When solving for the equation of velocity as a function of time, the following integral can be found:

$$\int_{v_{y1}}^{v_y} \frac{dv'_y}{g - kv'_y}, \text{ where } k = \frac{c_1}{m} \text{ and } v_{y1} \text{ is the initial velocity.}$$

i. Is the solution to this integral $-\frac{1}{k}\ln(g - kv_y)$? Explain how you arrived at your answer.

ii. At terminal velocity, $v_{ter} = \frac{g}{k}$. At this value, the integral "blows up." Explain why this is not a problem in solving the equation.