

Problem 26

A body of mass m is projected vertically upward with an initial velocity v_0 in a medium offering a resistance $k|v|$, where k is a constant. Assume that the gravitational attraction of the earth is constant.

- (a) Find the velocity $v(t)$ of the body at any time.
- (b) Use the result of part (a) to calculate the limit of $v(t)$ as $k \rightarrow 0$ —that is, as the resistance approaches zero. Does this result agree with the velocity of a mass m projected upward with an initial velocity v_0 in a vacuum?
- (c) Use the result of part (a) to calculate the limit of $v(t)$ as $m \rightarrow 0$ —that is, as the mass approaches zero.