

2. In our model of air resistance, the resistance force $R(v)$ depends only on velocity. However, for an object that drops a considerable distance, there is a dependence on the altitude as well. It is reasonable to assume that the resistance force $R(v, x)$ is proportional to air pressure, as well as to velocity. Furthermore, to a first-order approximation, air pressure varies exponentially with altitude (i.e., it is proportional to e^{-ax} , where a is a constant and x is altitude). Propose and justify (*but do not solve!*) a differential equation model for the velocity of a falling object subject to such a resistance force.