IC_W05D1-1 Table Problem: Center of Mass of Rod and Particle

A slender uniform rod of length $d$ and mass $m$ rests along the y-axis on a frictionless, horizontal table. A particle of equal mass $m$ is moving along the x-axis at a speed $v_0$. At $t = 0$ the particle strikes the end of the rod and sticks to it. Find a vector expression for the position of the center-of-mass of the system for (i) $t = 0$, (ii) $t > 0$. 

![Diagram of a slender uniform rod with a particle at the end]