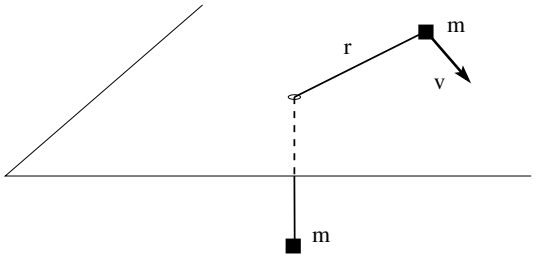
[mex228] Centripetal elevator

Two small blocks of mass m are connected by a string of length $2l$, which passes through a hole in a horizontal table. One block is free to slide on the table and the other block hangs underneath. In the initial state the block on the table is a distance $r = l$ from the hole and projected with velocity v horizontally and at right angle to the string. The hanging block is initially at rest. Ignore friction. (a) Find v such that the hanging block stays at rest. (b) Find v such that the hanging block moves up but comes to rest at the hole without going through the hole or touching the table.



Solution: