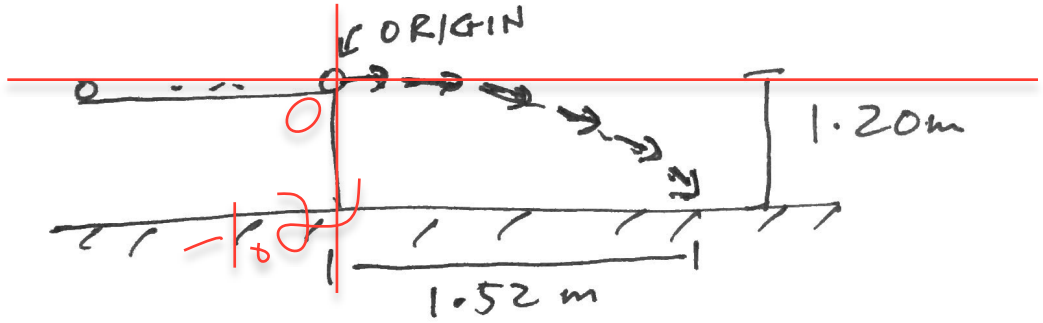
Example 2.

A small ball rolls horisontally off the edge of a tabletop that is 1.20m high. It strikes the floor at a point 1.52m horisontally from the table edge.

a) How long is the ball in the air?

b) what is its speed at the instant it leaves the table?



Proj:x I y
I: 0 I 0
F:1.52I -1.2

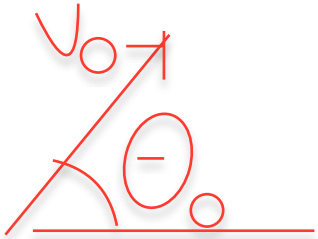
considering vertical motion:

a) $a = -g$

$y - y_0 = v_{oy}t + \frac{1}{2}a_y t^2$

$-1.2 - 0 = 0 - \frac{1}{2}g t^2$

$t =$ ☐

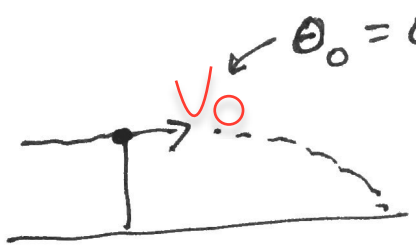


b) Horizontal speed stays constant.

$x - x_0 = (v_0 \cos\theta_0)\, t$

$1.52 - 0 = v_0 t$

$v_0 =$ ☐ ms^{-1}



$v_{ox} = v_0 \cos\theta_0 = v_0$

$v_{oy} = v_0 \sin\theta_0 = 0$