Where is the ball at time $t$?

## Model A



$$h = h_o - \frac{1}{2}gt^2 \quad \rightsquigarrow \quad t_1 = \sqrt{\frac{2h_o}{g}}$$

Does not take into account the ground!

Simulation :-

$g$ and $h_o$ are given
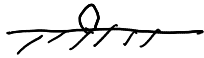
$h(t) \rightarrow$ output of the simulation

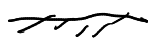## Model B

What happens from $t1$ to $t2$

at $t_1$

at $t_1 < t < t_2$

at $t_2$

$$V_{12} - K(-gt_1)$$

0

$h = 0$

$K = 0.8$

$t$ starts
from
zero here
$$\begin{cases} h = v_1 t - \frac{1}{2}gt^2 \\ v = \frac{\partial h}{\partial t} = v_1 - gt \end{cases}$$

$$t_2 - t_1 = \frac{2v_1}{g}$$

$$t\left(v_1 - \frac{1}{2}gt\right) = 0$$

$$t = 0 \qquad t = \frac{2v_1}{g}$$

Simulation :

✓ CHECK $t_1$ calculations

Ball trajectory from $t_1$ to $t_2$