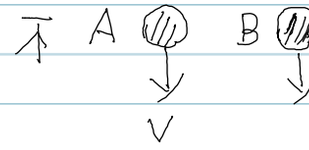
A 球與 B 球離開地面的高度均為 h 公尺（如圖）。兩球同時向下垂拋。A 球以 V 的速率向下垂拋，B 球以自由落體的方式向下垂拋。若 A 球比 B 球快 1 秒著地，求 V_0



$$S = v_0 t + \frac{1}{2} a t^2$$

$$h = vt + \frac{1}{2} g t^2$$

$$h = 0 + \frac{1}{2} g (t+1)^2$$

$$vt + \frac{1}{2} g t^2 = \frac{1}{2} g (t+1)^2$$

$$vt + \frac{1}{2} g t^2 = \frac{1}{2} g (t^2 + 2t + 1)$$

$$= \frac{1}{2} g t^2 + gt + \frac{1}{2} g$$

$$v = \frac{gt + \frac{1}{2} g}{t} = g + \frac{1}{2} \frac{g}{t} = g\left(1 + \frac{1}{2} \frac{1}{\sqrt{\frac{2h}{g}}}\right)$$

$$h = \frac{1}{2} g (t+1)^2 \qquad t+1 = \sqrt{\frac{2h}{g}} \qquad t = \sqrt{\frac{2h}{g}} - 1$$