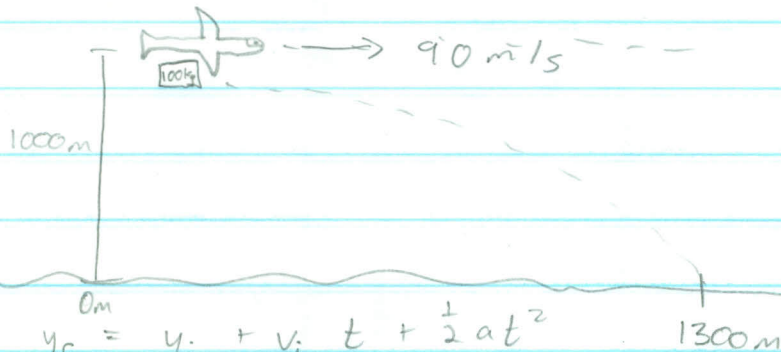


# VPython Airplane Drop

Scott Hickman



$$y_f = y_i + v_{i,y} t + \frac{1}{2} a t^2 \quad 1300 \text{ m}$$

$$0 = 1000 + 0 \cdot t + \frac{1}{2} (-9.81) t^2$$

$$-1000 = -4.905 t^2$$

$$t = 14.3 \text{ s}$$

$$v_{f,y} = v_{i,y} + a t$$

$$v_{f,y} = 0 - 9.81(14.3)$$

$$v_{f,y} = -140. \text{ m/s}$$

$$(90, -140.) \text{ m/s}$$

$$v = \sqrt{90^2 + (-140)^2} = 170 \text{ m/s}$$

The plane should be horizontally equal and 1000m above the package when it hits the ground.

$$\Delta x = v_x t \quad 90 \quad \Delta x = 90(14.3) = 1300 \text{ m}$$

The only issue experienced with the program is the time in which the package fell. The program says it falls in 2.32s, whereas it was calculated as 14.3s.