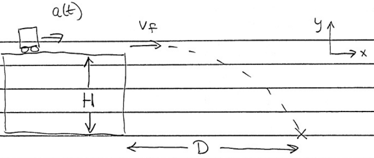

A cart has initial velocity $\vec{V_i} = 2.40 \frac{m}{s} \hat{\imath}$ at $t_i = 0.00$ s.
It accelerates at

$$\vec{a}(t) = \left(3.45 \frac{m}{s^4}\right) t^2 \hat{\imath}$$

for $t_2 = 0.50$ seconds, when it reaches the end of the table.
Therefore, its speed at end of table is

$$\vec{V}(t) = \vec{V_i} + \int_{t_1}^{t_2} \vec{a}(t)\, dt$$

$$= 2.40 \frac{m}{s} \hat{\imath} + \left(3.45 \frac{m}{s^4}\right) \hat{\imath} \int_{t_1}^{t_2} t^2\, dt$$

$$= 2.40 \frac{m}{s} \hat{\imath} + \left(3.45 \frac{m}{s^4}\right) \hat{\imath} \left[\tfrac{1}{3} t^3\right]_0^{0.50}$$

$$= 2.40 \frac{m}{s} \hat{\imath} + \left(3.45 \frac{m}{s^4}\right) \hat{\imath} \left[\tfrac{1}{3} (0.50\,s)^3\right]$$

$$= 2.40 \frac{m}{s} \hat{\imath} + 0.14 \frac{m}{s} \hat{\imath}$$

$$\boxed{V_f = 2.54 \frac{m}{s} \hat{\imath}}$$

Next, we need to compute distance D it travels horizontally. It will help to know the time it spends in the air, t_{air}.

Time to fall from initial height $H = 0.75$ m to the ground is

$$y(t) = y_i + V_y t + \frac{1}{2} a_y t^2$$

$$= H + 0 + \frac{1}{2}\left(-9.8 \frac{m}{s^2}\right) t^2$$

At time t_{air}, cart reaches the ground, so

$$y(t_{air}) = 0 = H - 4.9 \frac{m}{s^2} \cdot t_{air}^2$$

$$\Rightarrow t_{air} = \sqrt{\frac{0.75 \text{ m}}{4.9 \text{ m}/s^2}} = 0.391 \text{ s}$$

The cart moves as a projectile in the air, with constant x-velocity $V_x = V_f = 2.54 \text{ m/s} \uparrow$. So

$$D = x_i + V_x t_{air} + \frac{1}{2} a_x t_{air}^2$$

$$= 0 + \left(2.54 \frac{m}{s} \uparrow\right)(0.391 \text{ s}) + 0$$

$$\boxed{D = 0.995 \text{ m}}$$