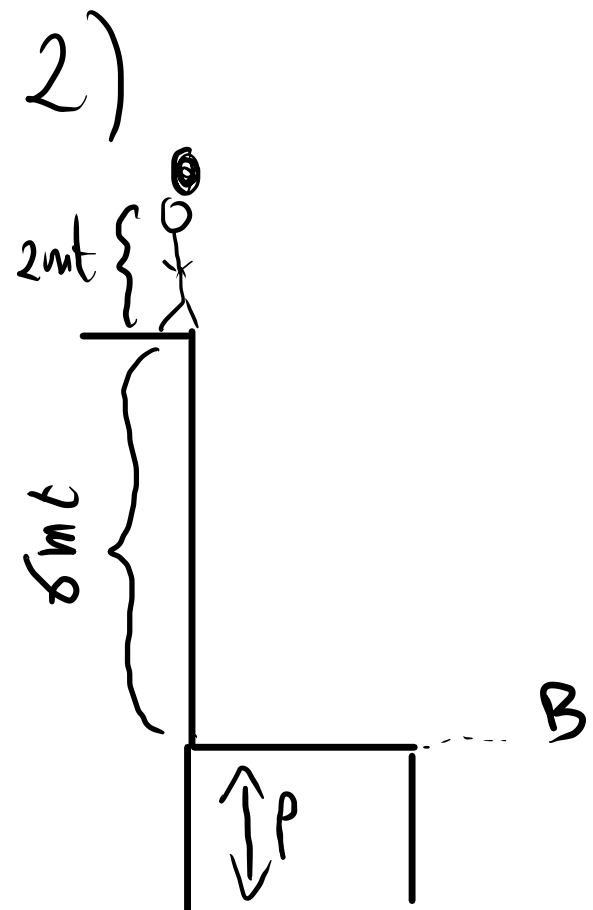


# CINEMATICA

1)

$$x(t) = 3t^3 - 5t^2 + 2$$
$$v(t) = 9t^2 - 10t$$
$$a(t) = 18t \Rightarrow \text{non uniformemente accelerato!}$$

ACCELERAZIONE VARIABILE



$$t_{\text{caduta}} = 1.45 = t_p$$

$$t_B = ? \quad y = 8 - \frac{1}{2}gt^2$$
$$0 = 8 - \frac{1}{2}gt^2$$

$$t = \sqrt{\frac{2 \cdot 8}{g}} = \sqrt{\frac{16}{g}} = 1.277 \text{ s} \Rightarrow t_{BP} = 1.45 - 1.277 = 0.173$$

$$P = v \cdot t_{BP} \Rightarrow v = 0 + at = gt = 9.81 \cdot 1.277 = 12.53 \text{ m/s}$$

$$P = 12.53 \cdot 0.173 = 2.16 \text{ m}$$

$$v_m = \frac{\Delta s}{\Delta t} = \frac{8 + 2.16}{1.45} = 7 \text{ m/s}$$

3)

$$v_A = 60 \text{ km/h} = 16.67 \text{ m/s}$$

$$v_B = 150 \text{ km/h} = 41.67 \text{ m/s}$$

$$x_A = x_0 + v_0 t + \frac{1}{2} a t^2 = d + 16.67 t$$

$$x_B = x_0 + v_0 t + \frac{1}{2} a t^2 = 41.67 t + \frac{1}{2} \cdot (-4.5) t^2$$

$$S_1 \text{ SCONTINUO} \Rightarrow X_A = X_B$$

$$\Rightarrow d + 16.67t = 41.67t - 4.25t^2$$

$$\Rightarrow 4.25t^2 - 25t + d = 0$$

$$\text{NON SI SCONTINUO SE NON HA SOL} \Rightarrow \Delta < 0$$

$$25^2 - 17d < 0 \Rightarrow d > \frac{25^2}{17} \Rightarrow d > 36.76$$