

## Exercício aula 6

$$v_{10} = 20 \text{ m/s}$$

a)



Velocidade:

$$v(t) = v_{10} - gt \Rightarrow T_{\text{sub}} = \frac{v_{10}}{g} \approx \frac{20}{10} \approx 2 \text{ s}$$

Altura máxima:

$$\begin{aligned} y_1 &= v_{10}T - \frac{1}{2}gT^2 \Rightarrow h_{\text{max}} = v_{10} \frac{v_{10}}{g} - \frac{1}{2}g \left(\frac{v_{10}}{g}\right)^2 \\ &= \frac{1}{2} \frac{v_{10}^2}{g} \\ &= \frac{1}{2} \frac{20^2}{10} \approx 20 \text{ m} \end{aligned}$$

b)  $t = 2 \text{ s} = T_{\text{sub}}$ :

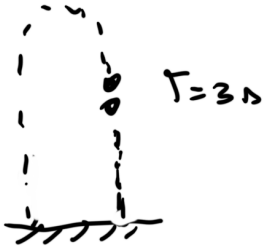
$$\Rightarrow y_1(t=2 \text{ s}) = 20 \text{ m}$$

$$\Rightarrow d = 20 \text{ m}$$

$$y_2(t=2 \text{ s}) = 0 \text{ m}$$

$$\text{Nota: } y_2(t) = v_{10}(t-2) - \frac{1}{2}g(t-2)^2$$

c)  $T = 3 \text{ s}$



$$y_1(T=3\text{s}) = y_2(T=3\text{s})$$

$$\Rightarrow 20 \times 3 - \frac{1}{2} g 3^2 = v_{20} (3-2) - \frac{1}{2} g (3-2)^2$$

$$\Rightarrow 60 - 45 = v_{20} - 5 \Rightarrow v_{20} = 20 \text{ m/s}$$