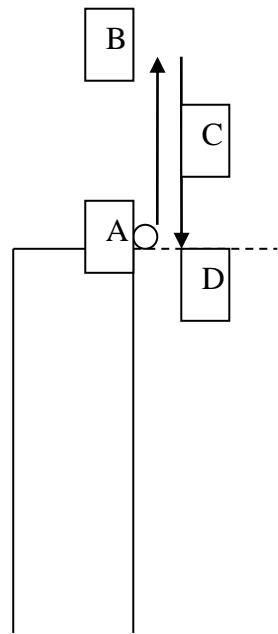


**Given:**

$$v_0 = 20 \text{ m/s} \quad t = 3 \text{ s} \quad \alpha = 90^\circ$$

**Find:**  $h$

## Solution:



Lets  $t_{AC} = t = 3s$

$$t_{AD} = 2 \frac{v_0 \sin \alpha}{g} = 4.08s$$

$$h_{AB} = \frac{v_0^2 \sin^2 \alpha}{2g} = 20.4m$$

$$t_{BD} = \sqrt{\frac{2h_{AB}}{g}} = 2.02s$$

$$t_{AB} = t_{AD} - t_{BD} = 2.06s$$

$$t_{BC} = t_{AC} - t_{AB} = 0.94s$$

$$h_{BC} = \frac{gt_{BC}^2}{2} = \frac{9.8 \cdot 0.8836}{2} m = 4.33m$$

$$h = h_{AB} - h_{BC} = 20.4m - 4.33m = 16.07m \approx 16m$$

**Answer:**  $h = 16m$