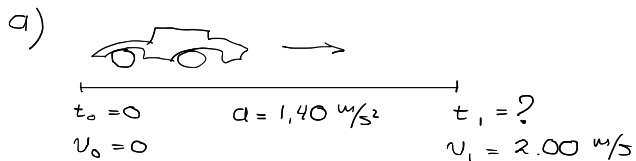


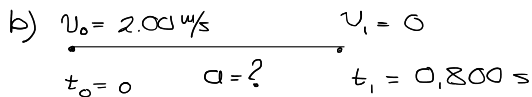
Problem 1: (1-03-40)

①



a: Constant

$$v_1 = v_0 + at_1 = at_1 \rightarrow t_1 = \frac{v_1}{a} = \frac{2.00}{1.40} \approx \underline{1.43 \text{ s}}$$

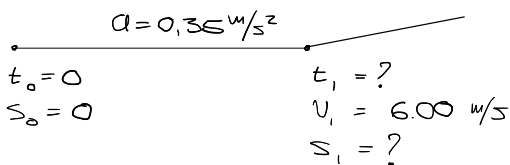


$$v_1 = v_0 + at_1$$

$$0 = v_0 + at_1 \rightarrow a = -\frac{v_0}{t_1} = -\frac{2.00 \text{ m/s}}{0.800 \text{ s}} = \underline{-2.50 \frac{\text{m}}{\text{s}^2}}$$

Problem 3: (1-03-60)

③



$$s_1 = s_0 + v_0 t_1 + \frac{1}{2} a t_1^2 = \frac{1}{2} a t_1^2$$

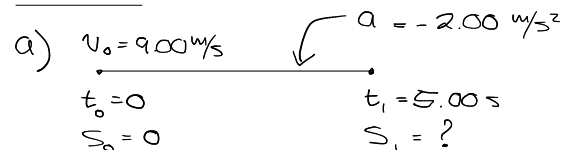
$$v_1 = v_0 + at_1 = at_1 \rightarrow t_1 = \frac{v_1}{a} \rightarrow s_1 = \frac{1}{2} a \left(\frac{v_1}{a}\right)^2 = \frac{v_1^2}{2a}$$

$$s_1 = \frac{(6.00)^2}{2 \cdot 0.35} \text{ m} \approx \underline{51 \text{ m}}$$

b) $t_1 = \frac{v_1}{a} = \frac{6.00}{0.35} \approx \underline{17 \text{ s}}$ The results look reasonable after observing this :)

Problem 2: (1-03-54)

②

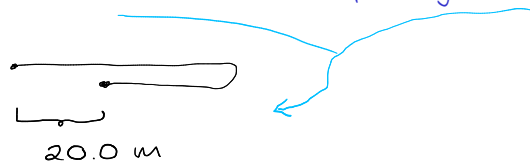


$$v_1 = v_0 + at_1 = \{ 9.00 - 2.00 \cdot 5.00 \} \text{ m/s} = \underline{-1.00 \text{ m/s}} \quad \text{b)}$$

so, she has turned around

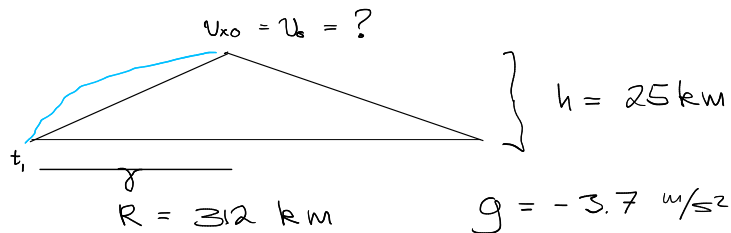
$$s_1 = s_0 + v_0 t_1 + \frac{1}{2} a t_1^2 = \left\{ 0 + 9.00 \cdot 5.00 - \frac{1}{2} \cdot 2.00 \cdot (5.00)^2 \right\} \text{ m} = \underline{20.0 \text{ m}}$$

So, she turns around, that is probably not a usual behavior here...



Problem 4: (1-04-56)

④



Vertical motion

$$h_1 = 0 = h_0 + \frac{1}{2} g t_1^2$$

Horizontal motion

$$R = 0 + v_0 t_1 \rightarrow v_0 = \frac{R}{t_1} \text{ or } t_1 = \frac{R}{v_0}$$

$$0 = h_0 + \frac{g}{2} \left(\frac{R}{v_0}\right)^2 \rightarrow v_0^2 h_0 + \frac{g}{2} R^2 = 0$$

$$v_0^2 = -\frac{gR^2}{2h_0} \rightarrow v_0 = \sqrt{-\frac{gR^2}{2h_0}} \approx \underline{2.7 \cdot 10^3 \text{ m/s}}$$