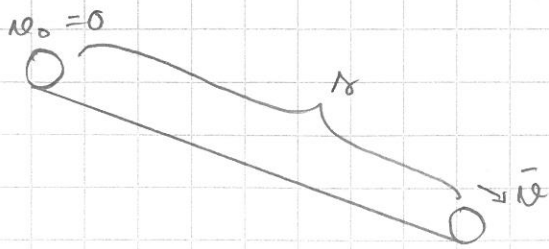


4.13



$$l_0 = 1,70 \text{ m}$$

$$v_0 = 1,9 \frac{\text{m}}{\text{s}}$$

Pajdai katterumus an vadia
 \rightarrow a vadia

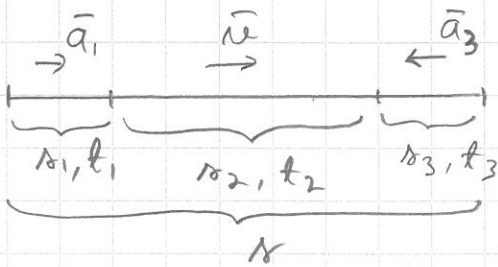
$$x = v_0 t \quad (\Rightarrow) \quad t = \frac{x}{v_0} = \frac{1,70 \text{ m}}{1,9 \frac{\text{m}}{\text{s}}} = 0,894737 \text{ s}$$

$$a) \quad v_2 = \frac{v_0 + v}{2} = \frac{v}{2} \quad | \cdot 2 \quad (\Rightarrow) \quad v = 2 v_2 = 2 \cdot 1,9 \frac{\text{m}}{\text{s}} = 3,8 \frac{\text{m}}{\text{s}}$$

\uparrow
a vadia

$$b) \quad a = \frac{\Delta v}{\Delta t} = \frac{v - v_0}{t} = \frac{v}{t} = \frac{3,8 \frac{\text{m}}{\text{s}}}{0,894737 \text{ s}} = 4,24706 \frac{\text{m}}{\text{s}^2} \approx 4,2 \frac{\text{m}}{\text{s}^2}$$

4.12



$$a_1 = 1,1 \frac{\text{m}}{\text{s}^2}$$

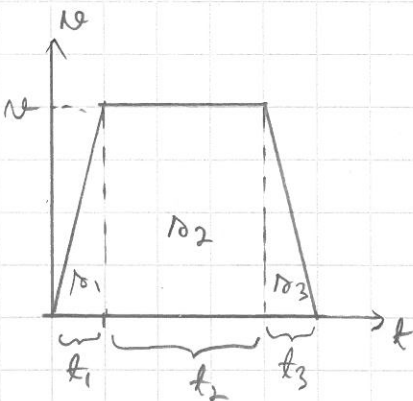
$$a_3 = -1,1 \frac{\text{m}}{\text{s}^2}$$

$$v = 155 \frac{\text{m}}{\text{h}}$$

$$l_0 = 145 \text{ km}$$

$$a_1 = \frac{\Delta v}{\Delta t} = \frac{v - v_0}{t_1} = \frac{v}{t_1} \quad | \cdot \frac{t_1}{a_1}$$

$$\Rightarrow t_1 = \frac{v}{a_1} = \frac{155 \frac{\text{m}}{\text{h}}}{1,1 \frac{\text{m}}{\text{s}^2}} \approx 39,1414 \text{ s} \approx t_3 \text{ (symmetric)}$$



$$v_2 = \frac{v_0 + v}{2} = \frac{v}{2} = \frac{v}{t_1} \quad | \cdot t_1$$

\uparrow
a vadia

$$\Rightarrow l_1 = \frac{1}{2} v t_1 = \frac{1}{2} \cdot \frac{155 \frac{\text{m}}{\text{h}}}{3,6 \frac{\text{h}}{\text{s}}} \cdot 39,1414 \text{ s} = 842,627 \text{ m}$$

$$l_3 = l_1 \text{ (symmetric)}$$

$$\Rightarrow l_1 + l_2 + l_3 = l_0 \quad (\Rightarrow) \quad l_2 = l_0 - 2l_1 = 143,315 \text{ km}$$

$$v = \frac{l_2}{t_2} \quad | \cdot \frac{t_2}{v} \quad (\Rightarrow) \quad t_2 = \frac{l_2}{v} = \frac{143,315 \text{ km}}{155 \frac{\text{km}}{\text{h}}} = 0,924613 \text{ h} \approx 55,4768 \text{ min}$$

$$\Rightarrow \text{lyhin aiko: } t_1 + t_2 + t_3 \approx 56,7815 \text{ min} \approx 57 \text{ min}$$