

Aufgabe 2

2.1 1. Zeitabschnitt: $\Delta t_1 = 5,0 \text{ s}$; $a_1 = 4,0 \text{ m/s}^2$; $v_0 = 0$

$$v_1 = a_1 \cdot \Delta t_1 = 4,0 \text{ m/s}^2 \cdot 5,0 \text{ s} = 20 \text{ m/s}^1 \quad ; \quad \underline{v(5,0 \text{ s}) = 20 \text{ m/s}^1}$$

$$s_1 = \frac{1}{2} a_1 (\Delta t_1)^2 = \frac{1}{2} \cdot 4,0 \text{ m/s}^2 \cdot (5,0 \text{ s})^2 = \underline{50 \text{ m} = x(t_1)}$$

2. Zeitabschnitt: $v_2 = 20 \text{ m/s}^1$; $s_2 = 60 \text{ m}$; $a = 0$

$$s_2 = v_2 \cdot \Delta t_2 \Leftrightarrow \Delta t_2 = \frac{s_2}{v_2} = \frac{60 \text{ m}}{20 \text{ m/s}^1} \Rightarrow \Delta t_2 = 3,0 \text{ s}$$

$$\underline{x(8,0 \text{ s}) = s_1 + s_2 = 110 \text{ m}} \quad ; \quad \underline{v(8,0 \text{ s}) = 20 \text{ m/s}^1}$$

3. Zeitabschnitt: $s_3 = 40 \text{ m}$; $v_0 = 20 \text{ m/s}^1$; $v = 0$

$$v^2 - v_0^2 = 2a_3 s_3 \Leftrightarrow a_3 = \frac{v^2 - v_0^2}{2s_3} = \frac{0 - (20 \text{ m/s}^1)^2}{2 \cdot 40 \text{ m}} = -5,0 \text{ m/s}^2$$

$$\underline{x(12 \text{ s}) = s_1 + s_2 + s_3 = 150 \text{ m}} \quad ; \quad \underline{v(12 \text{ s}) = 0}$$

2.2 $t_{\text{ges}} = \Delta t_1 + \Delta t_2 + \Delta t_3 = 12 \text{ s}$

$$\left. \begin{aligned} v &= a_3 \Delta t_3 + v_0 \Leftrightarrow \Delta t_3 = \frac{v_0 - v}{a_3} \\ \Delta t_3 &= \frac{0 - 20 \text{ m/s}^1}{-5,0 \text{ m/s}^2} \Rightarrow \Delta t_3 = 4,0 \text{ s} \end{aligned} \right\}$$

2.3 $t = 10 \text{ s}$

Dann: Fahrt $\Delta t_4 = 2,0 \text{ s}$ lang mit $a = -4,0 \text{ m/s}^2$ und $v_0 = 20 \text{ m/s}^1$

$$s_4 = \frac{1}{2} a_3 (\Delta t_4)^2 + v_0 \cdot \Delta t_4 = \frac{1}{2} (-4,0 \frac{\text{m}}{\text{s}^2}) \cdot (2,0 \text{ s})^2 + 20 \frac{\text{m}}{\text{s}} \cdot 2,0 \text{ s} = 30 \text{ m}$$

$$\underline{x(10 \text{ s}) = s_1 + s_2 + s_4 = 140 \text{ m}}$$

