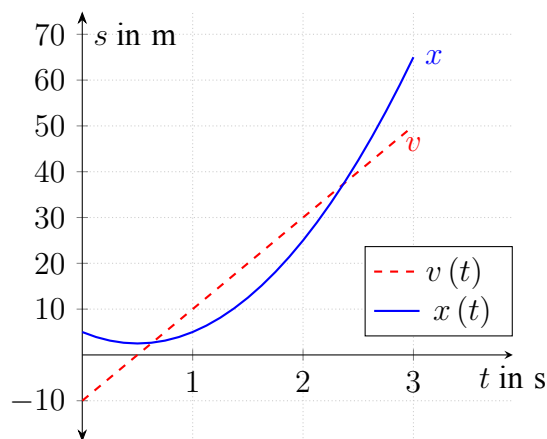


11. Gleichmäßig beschleunigte Bewegung

$$x(t) = x_0 + v_0 t + \frac{1}{2} a t^2$$

a) $x(0\text{s}) = 5\text{ m}, \quad x(1\text{s}) = 5\text{ m}, \quad x(3\text{s}) = 65\text{ m}$



$$v(t) = -10 + 20t$$

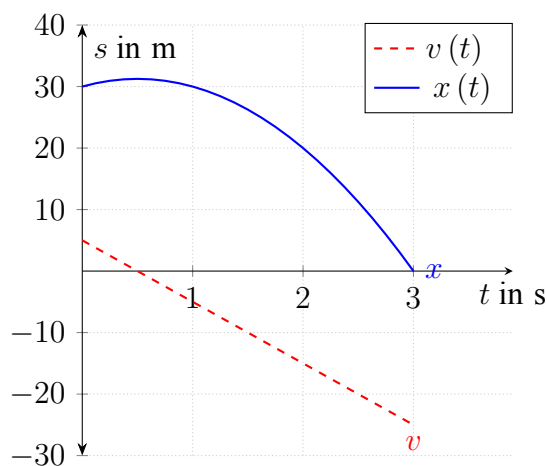
$$x(t) = 5 - 10t + 10t^2$$

$$x_0 = \underline{\underline{5\text{ m}}}$$

$$v_0 = \underline{\underline{-10\text{ m/s}}}$$

$$a = \underline{\underline{20\text{ m/s}^2}}$$

b) $v(0\text{s}) = 5\text{ m/s}, \quad x(1\text{s}) = 30\text{ m}, \quad x(2\text{s}) = 20\text{ m}$



$$v(t) = 5 - 10t$$

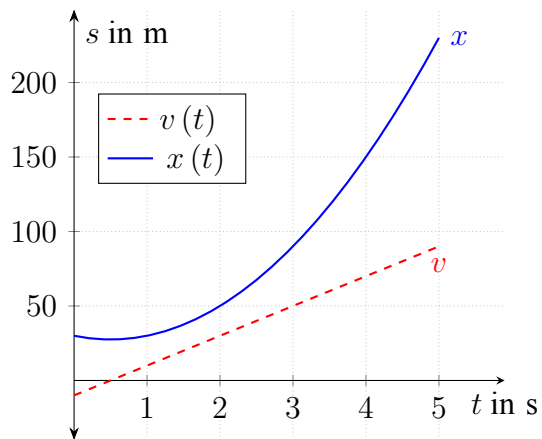
$$x(t) = 30 + 5t - 5t^2$$

$$x_0 = \underline{\underline{30\text{ m}}}$$

$$v_0 = \underline{\underline{5\text{ m/s}}}$$

$$a = \underline{\underline{-10\text{ m/s}^2}}$$

c) $v(0) = -10 \text{ m/s}$, $v(2\text{s}) = 30 \text{ m/s}$, $x(5\text{s}) = 230 \text{ m}$



$$v(t) = -10 + 20t$$

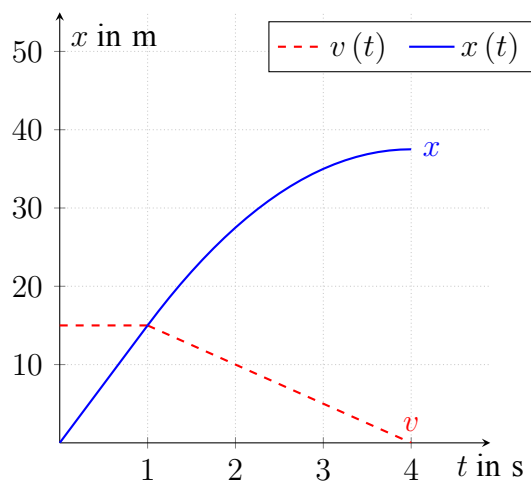
$$x(t) = 30 - 10t + 10t^2$$

$$x_0 = \underline{\underline{30 \text{ m}}}$$

$$v_0 = \underline{\underline{-10 \text{ m/s}}}$$

$$a = \underline{\underline{20 \text{ m/s}^2}}$$

12. Bremsvorgang an einer Ampel



a)

$$v(t) = \begin{cases} 15 & \forall 0 \leq t < 1, \\ -5t + 20 & \forall 1 \leq t \leq 4. \end{cases}$$

b)

$$x(t) = \begin{cases} 15t & \text{für } 0 \leq t < 1, \\ -2.5t^2 + 20t - 2.5 & \text{für } 1 \leq t \leq 4. \end{cases}$$

c) $t_2 = \underline{\underline{4 \text{ s}}}$; $x_2 = \underline{\underline{37.5 \text{ m}}}$

13. Fahrstuhl

a) $s_1 = x(2) - x(0) = \underline{\underline{4 \text{ m}}}$

b) $s_2 = x(9) - x(2) = \underline{\underline{28 \text{ m}}}$

c) $s_3 = x(11) - x(9) = \underline{\underline{4 \text{ m}}}$

d) $\frac{s_1 + s_2 + s_3}{4} + 3 = \underline{\underline{12 \text{ Stockwerke}}}$

$$a(t) = \begin{cases} 2 & \text{für } 0 \leq t \leq 2, \\ 0 & \text{für } 2 < t \leq 9, \\ -2 & \text{für } 9 < t \leq 11. \end{cases}$$

$$v(t) = \begin{cases} 2t & \text{für } 0 \leq t \leq 2, \\ 4 & \text{für } 2 < t \leq 9, \\ -2t + 22 & \text{für } 9 < t \leq 11. \end{cases}$$

$$x(t) = \begin{cases} t^2 & \text{für } 0 \leq t \leq 2, \\ 4t - 4 & \text{für } 2 < t \leq 9, \\ -t^2 + 22t - 85 & \text{für } 9 < t \leq 11. \end{cases}$$