Løsningsforslag Oblig 1 TRE1400 høsten 2024

1. $v_0 = 4{,}0\ \frac{m}{s}$ $\quad t = 10\,s$ $\quad a = \text{konst.}$ $\quad s = ?$

$v = 13{,}2\ \frac{m}{s}$

$$s = \frac{v_0 + v}{2} \cdot t = \frac{(4{,}0 + 13{,}2)\ \frac{m}{s}}{2} \cdot 10\,s = \underline{86\,m}$$

2. $t = 15{,}0\,s$

$$v_0 = 60\ \frac{km}{h} = 60 \cdot \frac{1000\,m}{3600\,s} = 16{,}66\ \frac{m}{s}$$

$$v = 30\ \frac{km}{h} = 30 \cdot \frac{1000\,m}{3600\,s} = 8{,}333\ \frac{m}{s}$$

$\bar{a} = ?$

$$\bar{a} = \frac{\Delta v}{\Delta t} = \frac{v - v_0}{t - 0} = \frac{(8{,}333 - 16{,}66)\ \frac{m}{s}}{15{,}0\,s} = \underline{-0{,}56\ \frac{m}{s^2}}$$

3. $v_0 = 0{,}12\ \frac{m}{s}$

$s = 0{,}80\,m$

$a = 2{,}65\ \frac{m}{s^2}$

$v = ?$

$$v^2 - v_0^2 = 2as$$

$$v^2 = 2as + v_0^2$$

$$v = \sqrt{2as + v_0^2}$$

$$v = \sqrt{2 \cdot 2{,}65\ \frac{m}{s^2} \cdot 0{,}80\,m + (0{,}12\,m)^2} = \underline{2{,}1\ \frac{m}{s}}$$

4. $v_0 = 0$ $\quad +\downarrow$

$t = 1{,}3\,s$

$a = g = 9{,}81\ \frac{m}{s^2}$

$$s = v_0 t + \tfrac{1}{2} a t^2$$

$$s = \tfrac{1}{2} a t^2$$

$$s = \tfrac{1}{2} \cdot 9{,}81\ \frac{m}{s^2} \cdot (1{,}3\,s)^2 = \underline{8{,}3\,m}$$