

$$m=160 ; F=200 ; k=30$$

$$m \frac{dv}{dt} = F - kv$$

$$\Leftrightarrow$$

$$mv' + kv = F$$

$$\Leftrightarrow$$

$$v' + \frac{k}{m}v = \frac{F}{m}$$

$$V_{\text{hom}} = Ce^{-\frac{k}{m}t}$$

$$V_{\text{part}} = \frac{F}{m} \cdot \frac{m}{k} = \frac{F}{k}$$

$$V = V_{\text{hom}} + V_{\text{part}} = Ce^{-\frac{k}{m}t} + \frac{F}{k}$$

$$= Ce^{-\frac{3}{16}t} + \frac{20}{3}$$

$t=0$ vid ögonblicket

$$V(0) = 1,5 \Rightarrow C + \frac{20}{3} = \frac{3}{2} \Leftrightarrow C = \frac{3}{2} - \frac{20}{3} = -\frac{31}{6}$$

$$\text{och } V(7,5) = -\frac{31}{6} e^{-\frac{3}{16} \cdot 7,5} + \frac{20}{3} \approx 5,4 \text{ m/s}$$