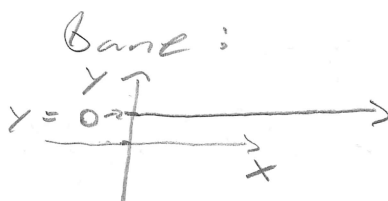


# Strømming, Øving 1 Vigard G. Jervell

Oppg 1a)

$$V = Z C_1 t$$

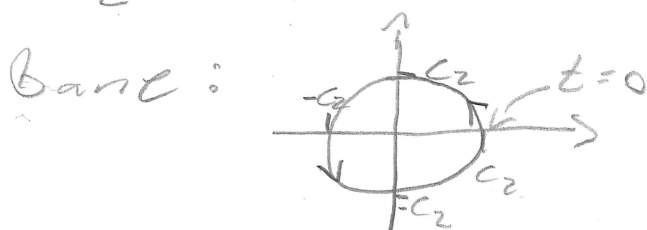
$$a = Z C_1$$



1b)

$$\vec{V} = [-\omega C_2 \sin(\omega t), \omega C_2 \cos(\omega t)]$$

$$\vec{a} = [-\omega^2 C_2 \cos(\omega t), -\omega^2 C_2 \sin(\omega t)]$$

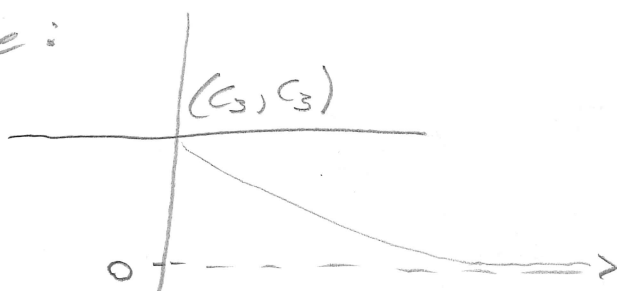


1c)

$$\vec{V} = [a C_3 e^{at}, -a C_3 e^{-at}]$$

$$\vec{a} = [a^2 C_3 e^{at}, a C_3 e^{-at}]$$

base:



Oppg 2a)

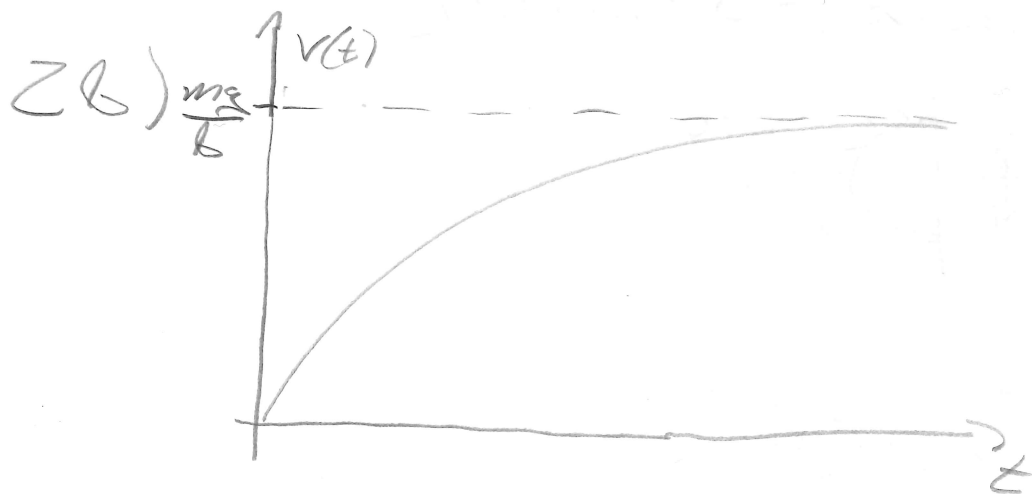
$$ma = mg - bV$$

$$\dot{V} + \frac{b}{m}V = g$$

$$V = Ce^{-\frac{b}{m}t} + \frac{mg}{b}$$

$$V(0) = 0 \rightarrow C = -\frac{mg}{b}$$

$$V = \frac{mg}{b}(1 - e^{-\frac{b}{m}t})$$



2c)

$$r = \int_0^t V(\tau) d\tau$$

$$r = \frac{mg}{b} \left( t + \frac{m}{b} e^{-\frac{b}{m}t} \right) + C$$

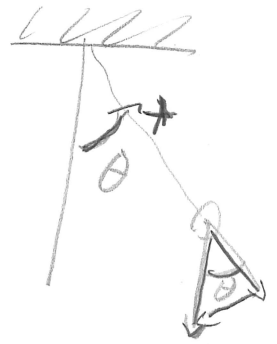
$$r(0) = 0 \rightarrow C = -g \left( \frac{m^2}{b^2} \right)$$

$$r = \frac{mg}{b} \left( t + \frac{m}{b} e^{-\frac{b}{m}t} \right) - g \left( \frac{m^2}{b^2} \right)$$

Oppg. 3a)

$$\frac{1}{2} I \omega^2 + mg \sin \theta = mg \sin \theta_{\max}$$

Hvor  $I = ml^2$



3b)  $ma = -mg \sin \theta$

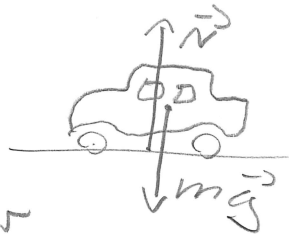
3c)  $a = -g \sin \theta \approx -g \theta$   
 $\ddot{\theta} + g \theta \approx 0$  ↖ For  $\theta \ll 1$

$\theta \approx \theta_{\max} \cos\left(\sqrt{\frac{g}{l}} t\right)$

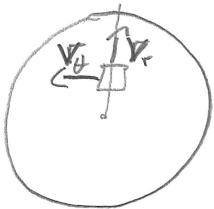
Oppg 4a)

$$\sum \vec{F} = m\vec{g} + \vec{N}$$

Der som plata roterer  
med konstant vinkelhast



4b)  $V_{\theta} = r\omega$ ,  $V_r$



$$\dot{V}_{\theta} = \omega r'(t) = \omega V_r$$

