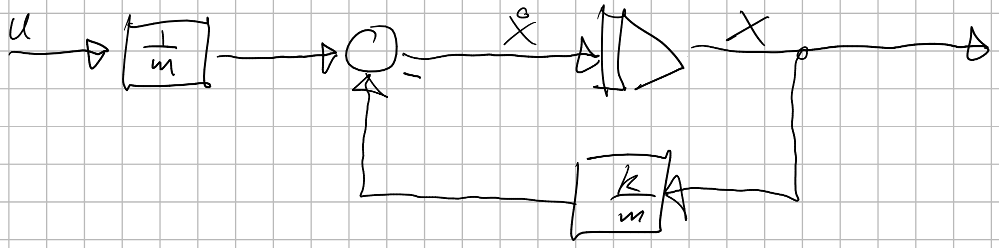
Kybkontro øving 3

$$\dot{v} = \frac{1}{m}u - \frac{k}{m}v$$



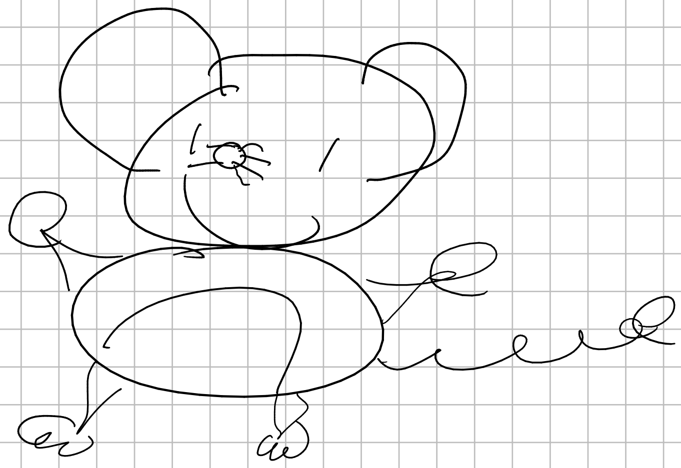
Opg 2)

a) $\Sigma M_z = J\ddot{\theta}$

$M_d = k_2\dot{\theta}$

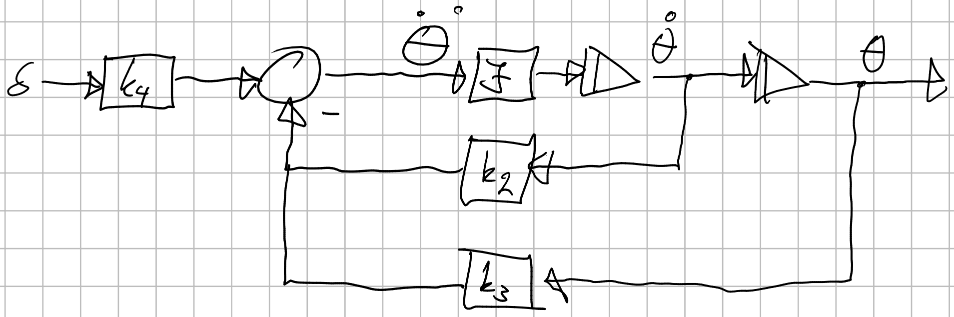
$M_T = k_3\theta$

$u = k_4\delta$



$\Sigma M_z = -k_2\dot{\theta} - k_3\theta - k_4\delta$

$J\ddot{\theta} + k_2\dot{\theta} + k_3\theta + k_4\delta = 0$



Oppg 3)

a) $(x, y) = (0, 0)$

$x = \cos(-\theta) \Rightarrow \cos\theta$

$\dot{x} = -v\sin\theta$

b) $y = \sin(-\theta) = -\sin\theta$

$\dot{y} = -v\cos\theta$

c) $J\ddot{\theta} + k_2\dot{\theta} + k_3\theta + k_4\delta = 0$

$$\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} \cos\theta \cdot \int v\,dt \\ -\sin\theta \cdot \int v\,dt \end{bmatrix}$$

$$v = e^{-\frac{k}{m}t}\left(v_0 - \frac{u}{k}\right) + \frac{u}{k}$$