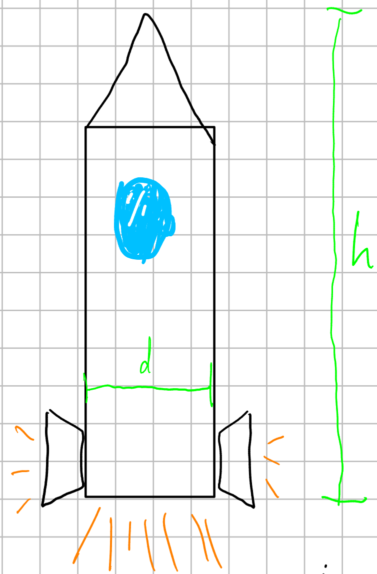
Antar luftkonstant er konstant uansett vinkel mellom raketten og $\dot{\vec{x}}$

Antar att tyngdekraften er konstant

Antar att massen er konstant

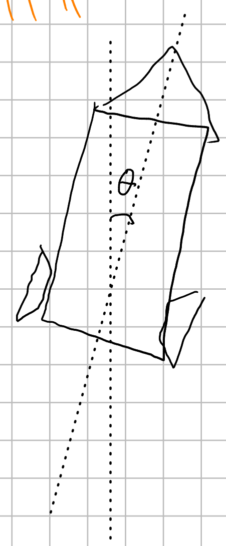
Antar att den målte vinkelen er den reelle vinkelen



$$\Sigma F = \text{thrust} - \text{luftmotstand} - mg\cos\theta$$

$$m\ddot{\vec{x}} = \vec{u} - k\dot{\vec{x}}^2 - mg\cos\theta \begin{bmatrix}0\\1\end{bmatrix}$$

$$m\ddot{x} + k\dot{x}^2 + mg\cos\begin{bmatrix}0\\1\end{bmatrix} = u$$



$$r = 0$$

$$e = 0 - \theta$$

Prøve PD & PID

$$u = K_P e + K_D \dot{e}$$

$$m\ddot{x} + k\dot{x}^2 + mg\cos\begin{bmatrix}0\\1\end{bmatrix} = K_P e + K_D \dot{e}$$

$m = 100\ \text{kg}$ $h = 5\ \text{m}$ $d = 0{,}40\ \text{m}$

$F_D = \frac{1}{2}\rho C_D A v^2$

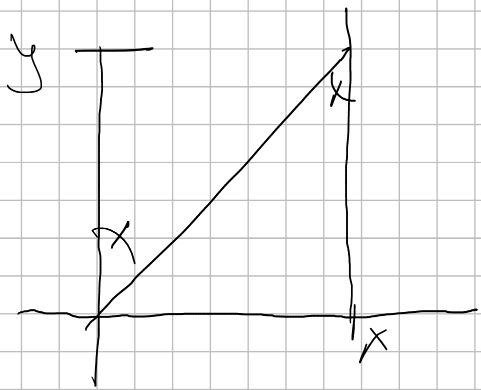
Antar at thrustere skal påvirke C_D

$k = \frac{1}{2}\rho C_D A$

Antar 0°C & konstant lufttrykk

$C_D = 0{,}5$ $\rho = 1{,}2923\ \text{kg/m}^3$ $A = \pi\left(\frac{d}{2}\right)^2$

Kjegle



$$\arctan\left(\frac{x}{y}\right)$$