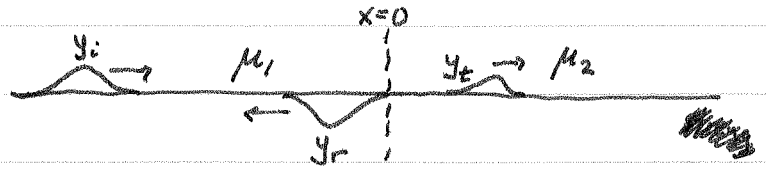
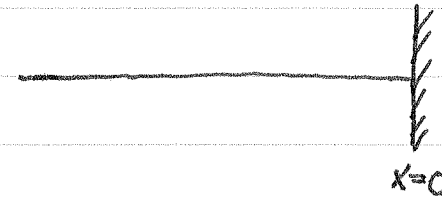
Stående bølger (LL 10.3, TM 16)

Fra sist:



Streng fast i vegg i $x=0$ (tilsv. $\mu_2 \to \infty$):



$$y_{r0} = y_{i0}$$

$$\Rightarrow \quad y_i(x,t) = y_{i0} \sin(kx - \omega t)$$
$$y_r(x,t) = y_{i0} \sin(kx + \omega t)$$

$$\Rightarrow \quad y(x,t) = y_i(x,t) + y_r(x,t)$$

$$= y_{i0} \left[\sin(kx - \omega t) + \sin(kx + \omega t) \right]$$

$$= y_{i0} \left[\sin kx \cos \omega t - \cos kx \sin \omega t + \sin kx \cos \omega t + \cos kx \sin \omega t \right]$$

$$= 2 y_{i0} \sin kx \cos \omega t$$

dvs harmonisk svingning ($\cos \omega t$) med x-avhengig amplitude ($2 y_{i0} \sin kx$), kalles stående bølge: