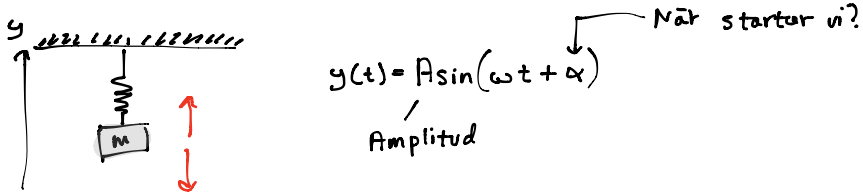
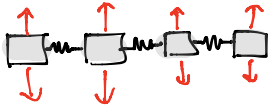


Vågor

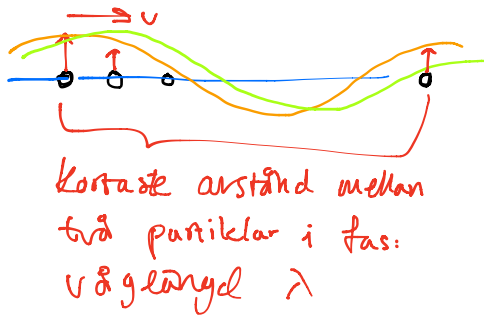
Svängningar genererar vågor



Kopplade partiklar



Hur hårt kopplade \circ massa påverkar vågen



Förflytta en $\lambda \rightarrow$ Period T
 $v = \frac{\lambda}{T}$

Komplexa tal

$$\tilde{z} = a + ib$$

$$\tilde{z} = |\tilde{z}| (\underbrace{\cos\theta + i\sin\theta}_{e^{i\theta}})$$

$$\Rightarrow \tilde{z} = |\tilde{z}| e^{i\theta} \quad \theta = \arctan\left(\frac{b}{a}\right)$$

Harmonisk våg

$$\tilde{y} = A e^{i(kx - \omega t)}$$

$$y = \operatorname{Re}(\tilde{y}) = A \cos(kx - \omega t)$$

$$y = \operatorname{Im}(\tilde{y}) = A \sin(kx - \omega t) \quad \text{Alla vågor är reella (Inga } i)$$

$$\psi = \frac{A}{r} e^{i(kr - \omega t)} \quad \leftarrow \text{sferisk våg}$$