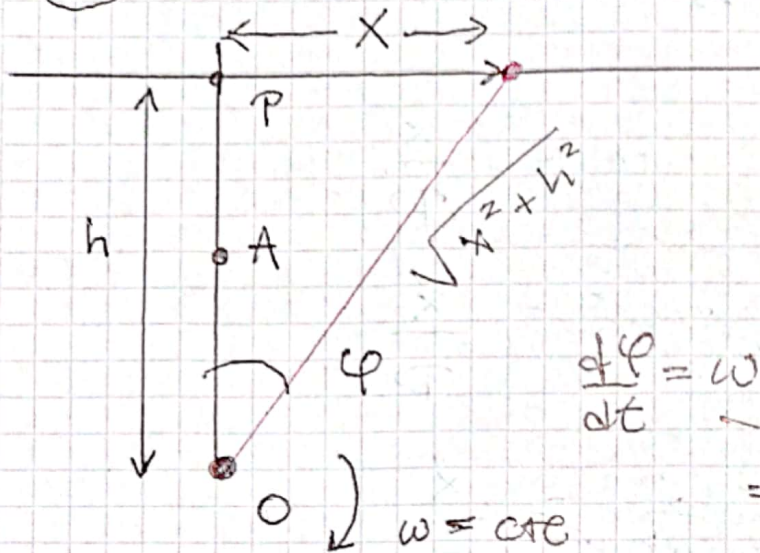


21 (cinemática)



$$\frac{d\varphi}{dt} = \omega = \dot{\varphi}$$

$$\Rightarrow \varphi = \omega t$$

$$\omega = \text{cte}$$

$$\tan \varphi = \frac{x}{h}$$

$$\dot{x}(t) = V(t)$$

$$x = h \tan \varphi \rightarrow \dot{x}(t) = h \frac{d}{dt} (\tan \varphi)$$

$$\dot{x}(t) = V = \frac{h \omega}{\cos^2 \varphi}$$

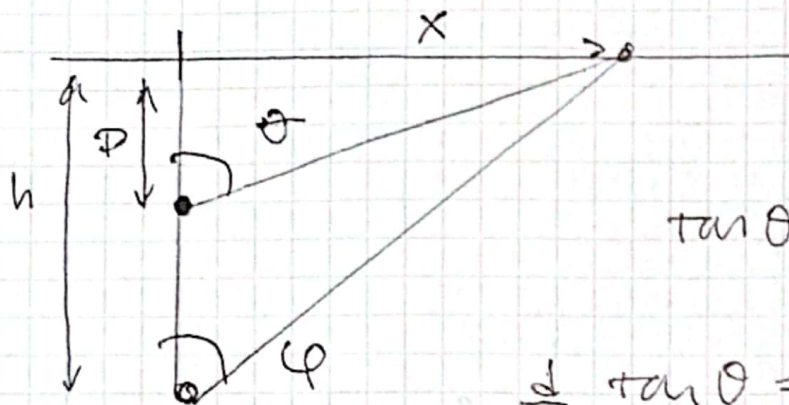
$$= h \frac{d \tan \varphi}{d \varphi} \cdot \frac{d \varphi}{dt}$$

$$\frac{1}{\cos^2 \varphi} \cdot \dot{\varphi} = \omega$$

~~$$\frac{d}{dt} \left(\frac{h \omega}{\cos^2 \varphi} \right)$$~~

$$\cos \varphi = \frac{h}{\sqrt{x^2 + h^2}}$$

$$V = \frac{\omega}{h} (x^2 + h^2) = \dot{x}$$



$$\tan \theta = \frac{x}{D}$$

$$\frac{d}{dt} \tan \theta = \frac{\dot{x}}{D}$$

$$\frac{1}{\cos^2 \theta} \frac{d\theta}{dt} = \frac{\dot{x}}{D}$$

$$\cos \theta = \frac{D}{\sqrt{D^2 + x^2}}$$

$$\dot{\theta} = \frac{\dot{x}}{D} \cdot \cos^2 \theta = \frac{\omega}{hD} (x^2 + h^2) \frac{D^2}{(D^2 + x^2)}$$

$$\left[\dot{\theta} = \frac{\omega D}{h} \frac{(x^2 + h^2)}{(x^2 + D^2)} \right]$$

si $D = h \Rightarrow \dot{\theta} = \omega$

$$v = \frac{h\omega}{\cos^2 \varphi} = \text{cte} \quad \dot{x}(t) = v = \text{cte}$$

$$\omega = ?$$

$$\left[\omega = \frac{v \cos^2 \varphi}{h} \right] = \dot{\varphi}$$