$$y(t) \quad = \quad y_{\max} \cos(\omega t + \phi)$$

$$v_y(t) \quad = \quad \frac{dy}{dt} \quad = \quad -\omega y_{\max} \sin(\omega t + \phi)$$

$$\mathrm{KE}_{\max} \quad = \quad \frac{1}{2} m v_{\max}^2$$

$$\mathrm{Energy} \quad = \quad \frac{1}{2} m v_{\max}^2$$

$$\mathrm{Energy} \quad = \quad \frac{1}{2} m \, \omega^2 y_{\max}^2$$

$$\mathrm{Energy} \quad = \quad \frac{1}{2} \left(\mu v T\right) \omega^2 y_{\max}^2$$

$$\mathrm{Power} \quad = \quad \frac{\mathrm{Energy}}{\mathrm{Time}} \quad = \quad \frac{1}{2} \left(\mu v\right) \omega^2 y_{\max}^2$$

$$v \quad = \quad \frac{\omega}{k}$$

$$\mathrm{Power} \quad = \quad \frac{1}{2} \frac{\mu}{k} \omega^3 y_{\max}^2$$