Seg Ter Qua Qui Sex Sáb Dom / /

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1. $g(x) = \cos(x)$, $\bar{x} = 0$

Linearizando por série de Taylor → função linear → apenas ordem 1.

$$\cos(x) \cong \cos(\bar{x}) + \left.\frac{d(\cos(x))}{dx}\right|_{x=\bar{x}} \cdot (x-\bar{x})$$

$$\cos(x) \cong \cos(0) + (-\text{sen}(0)) \cdot (x-0)$$

$$\cos(x) \cong 1 + 0(x-0) = 1$$ (para x próximo de $\bar{x}$)

$g(x) = \cos(x)$, $\bar{x} = \frac{\pi}{4}$

$$g(x) \cong g(\bar{x}) + \left.\frac{dg}{dx}\right|_{x=\bar{x}} (x-\bar{x}) = \cos\left(\frac{\pi}{4}\right) + \left(-\text{sen}\left(\frac{\pi}{4}\right)\right) \cdot \left(x - \frac{\pi}{4}\right)$$

$$g(x) = \cos(x) = \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}\left(x - \frac{\pi}{4}\right) = -\frac{\sqrt{2}}{2}x + \frac{\sqrt{2}}{2}\left(\frac{\pi}{4} + 1\right)$$

$$\cos(x) = -\frac{\sqrt{2}x}{2} + \frac{\sqrt{2}}{2}\left(\frac{\pi}{4} + 1\right)$$ (para x próximo de $\bar{x}$)

2. $m\dot{v} = F(t) - mru + mx\dot{r}$

$F(x) = F(t) - mru + mx\dot{r} - m\dot{v}$

Linearizando

$$F(x) \cong f(\bar{\dot{v}}, \bar{r}, \bar{\dot{r}}) + \left.\frac{df}{d\dot{v}}\right|_{eq} (\dot{v} - \bar{\dot{v}}) + \left.\frac{df}{dr}\right|_{eq} (r - \bar{r}) + \left.\frac{df}{d\dot{r}}\right|_{eq} (\dot{r} - \bar{\dot{r}})$$

Equilíbrio: $\bar{\dot{v}} = \bar{r} = \bar{\dot{r}} = 0$

$f(x) = F(t) - m\dot{v} - m\bar{u}r + m\bar{x}\cdot\dot{r}$

$m\dot{v} = f(t) - m\bar{u}r + m\bar{x}\dot{r}$ → sendo $f(x) = 0$