Exercícios

(1) Linearizando a função $f(x) = \cos x$

$$f(x) = \cos(\bar{x}) - \operatorname{sen}(\bar{x})(x - \bar{x})$$

- $\bar{x} = 0$:

$$f(x) = \cos(0) - \operatorname{sen}(0)(x) = 1$$

- $\bar{x} = \pi/4$

$$f(x) = \cos(\pi/4) - \operatorname{sen}(\pi/4)(x - \pi/4)$$

$$f(x) = \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}\left(x - \frac{\pi}{4}\right)$$

(2) Linearizando a função $f(\dot{v}, r, \dot{r}, v, u, x) = -m\dot{v} - mru + mx\dot{r} = -F(t)$

$$f = f(\bar{\dot{v}}, \bar{r}, \bar{\dot{r}}, \bar{v}, \bar{u}, \bar{x}) - m(\dot{v} - \bar{\dot{v}}) - mu(r - \bar{r}) + mx(\dot{r} - \bar{\dot{r}}) - mr(u - \bar{u}) + m\dot{r}(x - \bar{x})$$

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