NATHAN DALEFFI RODRIGUES RAYES 10772585

1) a) $f(x) = \cos x \Rightarrow g(x) = f(\bar{x}) + \left.\frac{df}{dx}\right|_{x=\bar{x}} (x-\bar{x})$

$\Rightarrow g(x) = 1$

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

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2) $f = m \times \dot{r} - m r \mu - m \dot{v}$ EM TORNO DE $\dot{\bar{v}} = \dot{\bar{r}} = \ddot{\bar{r}} = 0$

$\Rightarrow f = f(\bar{x}, \bar{v}, \dots) + \left.\frac{\partial f}{\partial x}\right|_{x=\bar{x}} (x-\bar{x}) + \left.\frac{\partial f}{\partial r}\right|_{r=\bar{r}} (r-\bar{r}) + \left.\frac{\partial f}{\partial \dot{r}}\right|_{\dot{r}=\dot{\bar{r}}} (\dot{r}-\dot{\bar{r}})$

$+ \left.\frac{\partial f}{\partial \dot{v}}\right|_{\dot{v}=\dot{\bar{v}}} (\dot{v}-\dot{\bar{v}}) + \left.\frac{\partial f}{\partial \mu}\right|_{\mu=\bar{\mu}} (\mu-\bar{\mu})$

$\Rightarrow f = -m\dot{v} + m\bar{x}\dot{r} - m\bar{\mu}r$