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1) $f(x) = \cos x$

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

$$g(x) = 1$$

em termo de $v = \bar{v} = \dot{r}$

2) $f = m \dot{x} \dot{r} - m v \dot{v}$

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

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

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