

Modelagem - Ex aula (17/09)

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

a) $\bar{x} = 0$

$$f(x) \approx f(\bar{x}) + \left. \frac{\partial f}{\partial x} \right|_{\bar{x}} (x - \bar{x})$$

$$f(x) \approx \cos(0) + (-\sin(0)) \cdot (x - 0)$$

$$f(x) \approx 1$$

b) $\bar{x} = \frac{\pi}{4}$

$$f(x) \approx f(\bar{x}) + \left. \frac{\partial f}{\partial x} \right|_{\bar{x}} (x - \bar{x})$$

$$f(x) \approx \cos\left(\frac{\pi}{4}\right) + \left(-\sin\frac{\pi}{4} \cdot \left(x - \frac{\pi}{4}\right)\right)$$

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