

Taller 12

a)

$$f(x) = (1.1x) - (1.9x^3) + (1.2x^2) - (2x) + 4$$

$$F'(x) = 4(1.1)^2 - 3 \cdot (1.9x^2) + 2(1.2x) - 2$$

$$F'(x) = 4.4x^3 - 5.7x^2 + 2.4 - 2$$

$$\begin{aligned} f'(1.4) &= 4.4(1.4)^3 - 5.7(1.4)^2 + 2.4(1.4) - 2 \\ &= 12.0576 - 11.172 + 3.36 - 2 \\ &= 2.2696 \end{aligned}$$

$$\Delta F = 12.2696 \cdot 0.05$$

$$\Delta F \approx 0.11328$$

b)

$$F'(x) (\cos(x)) \cdot \ln(2x) + \cos(x) (\ln(2x))$$

$$F'(x) = -\operatorname{sen}(x) \cdot \ln(2x) + \cos(x) \cdot \frac{1}{x}$$

$$\ln(2 \cdot \frac{\pi}{3}) = \ln\left(\frac{2\pi}{3}\right)$$

$$\begin{aligned} F'\left(\frac{\pi}{3}\right) &= -\frac{\sqrt{3}}{2} \ln\left(\frac{2\pi}{3}\right) + \frac{1}{2} \cdot \frac{1}{\frac{\pi}{3}} \\ &= -\frac{\sqrt{3}}{2} \cdot \ln\left(\frac{2\pi}{3}\right) + \frac{3}{2\pi} \end{aligned}$$

$$\Delta F \approx |F'(x)| \Delta x$$

$$\Delta F \approx \left| -\frac{\sqrt{3}}{2} \ln\left(\frac{2\pi}{3}\right) + \frac{3}{2\pi} \right| \cdot 0.005$$

$$F'\left(\frac{\pi}{3}\right) = -\frac{\sqrt{3}}{2} \cdot 0.73 + 0.477 = -0.643 + 0.477 = -0.166$$

$$\Delta F \approx 0.166 \cdot 0.005 = 0.00083$$