Taller 11.

1. $\tilde{x} = 1,5$ $\quad f(x) = 1,25x^4 - x^3 + 1,5x^2 - 2x + 4,5$

$\Delta\tilde{x} = 0,05$

$x \in [\tilde{x} - \Delta x, \ \tilde{x} + \Delta\tilde{x}]$ $\quad \Delta f(1,5) = |5(1,5)^3 - 3(1,5)^2 + 3(1,5) - 2| \cdot 0,05$

$x \in [1,5 - 0,05, \ 1,5 + 0,05]$ $\quad \Delta f(1,5) = 12,625 \cdot 0,05$

$x \in [1,45, \ 1,55]$ $\quad \Delta f(1,5) = 0,63125$

$f(x) \in [f(\tilde{x}) - \Delta f(\tilde{x}), \ f(\tilde{x}) + \Delta f(\tilde{x})]$

$f(x) \in [((1,25(1,5)^4 - (1,5)^3 + 1,5(1,5)^2 - 2(1,5) + 4,5) - 0,63125), \ ((1,25(1,5)^4 - (1,5)^3 + 1,5(1,5)^2 - 2(1,5) + 4,5) + 0,63125)]$

$f(x) \in [(7,828125 - 0,63125), \ (7,828125 + 0,63125)]$

$f(x) \in [7,195975, \ 8,459375]$

2. $\tilde{x} = \frac{\pi}{4}$ $\quad f(x) = \cos(x) \cdot \ln(2x)$

$\Delta\tilde{x} = 0,005$

$x \in [\tilde{x} - \Delta x, \ \tilde{x} + \Delta\tilde{x}]$

$x \in [\pi/4 - 0,005, \ \pi/4 + 0,005]$

$x \in [0,7803981634, \ 0,7903981634]$

$$\Delta f(\pi/4) = \left| -\operatorname{sen}\left(\frac{\pi}{4}\right) \cdot \left(\ln(2) + \ln\left(\frac{\pi}{4}\right)\right) + \frac{\cos(\pi/4)}{\pi/4} \right| \cdot (0,005)$$

$\Delta f(\pi/4) = 1,266929919 \cdot 0,005$

$\Delta f(\pi/4) = 6,334649597 \times 10^{-3}$

$$f(x) \in \left[f(\tilde{x}) - \Delta f(\tilde{x}) \, , \; f(\tilde{x}) + \Delta f(\tilde{x}) \right]$$

$$f(x) \in \left[\left(\cos\left(\frac{\pi}{4}\right) \cdot \ln\left(2\left(\frac{\pi}{4}\right)\right) - 6{,}334649597 \times 10^{-3} \right) , \right.$$

$$\left. \left(\cos\left(\frac{\pi}{4}\right) \cdot \ln\left(2\left(\frac{\pi}{4}\right)\right) + 6{,}334649597 \times 10^{-3} \right) \right]$$

$$f(x) \in \left[(0{,}451540279 - 6{,}334649597 \times 10^{-3}) \, , \; (0{,}451540279 + 6{,}334649597 \times 10^{-3}) \right]$$

$$f(x) \in \left[0{,}445205629\,4 \, , \; 0{,}457874928\,6 \right]$$