Taylorův polynom 3. stupně

$$f(x) = (x-2)\cdot \ln(x-3)+1 \qquad x=4$$

I) $f(4) = (4-2)\cdot\ln(4-3)+1 = 2\cdot\ln 1+1 = \underline{\underline{1}}$

II) $f'(x) = \ln(x-3)+(x-2)\cdot\frac{1}{x-3} = \underline{\underline{\ln(x-3)+\frac{x-2}{x-3}}}$

$f'(4) = \ln 1 + \frac{2}{1} = \underline{\underline{2}}$

III) $f''(x) = \frac{1}{x-3}+\frac{1\cdot(x-3)-(x-2)}{(x-3)^2} = \frac{\cancel{x}-3+x-3-\cancel{x}+2}{(x-3)^2} = \frac{x-4}{(x-3)^2}$

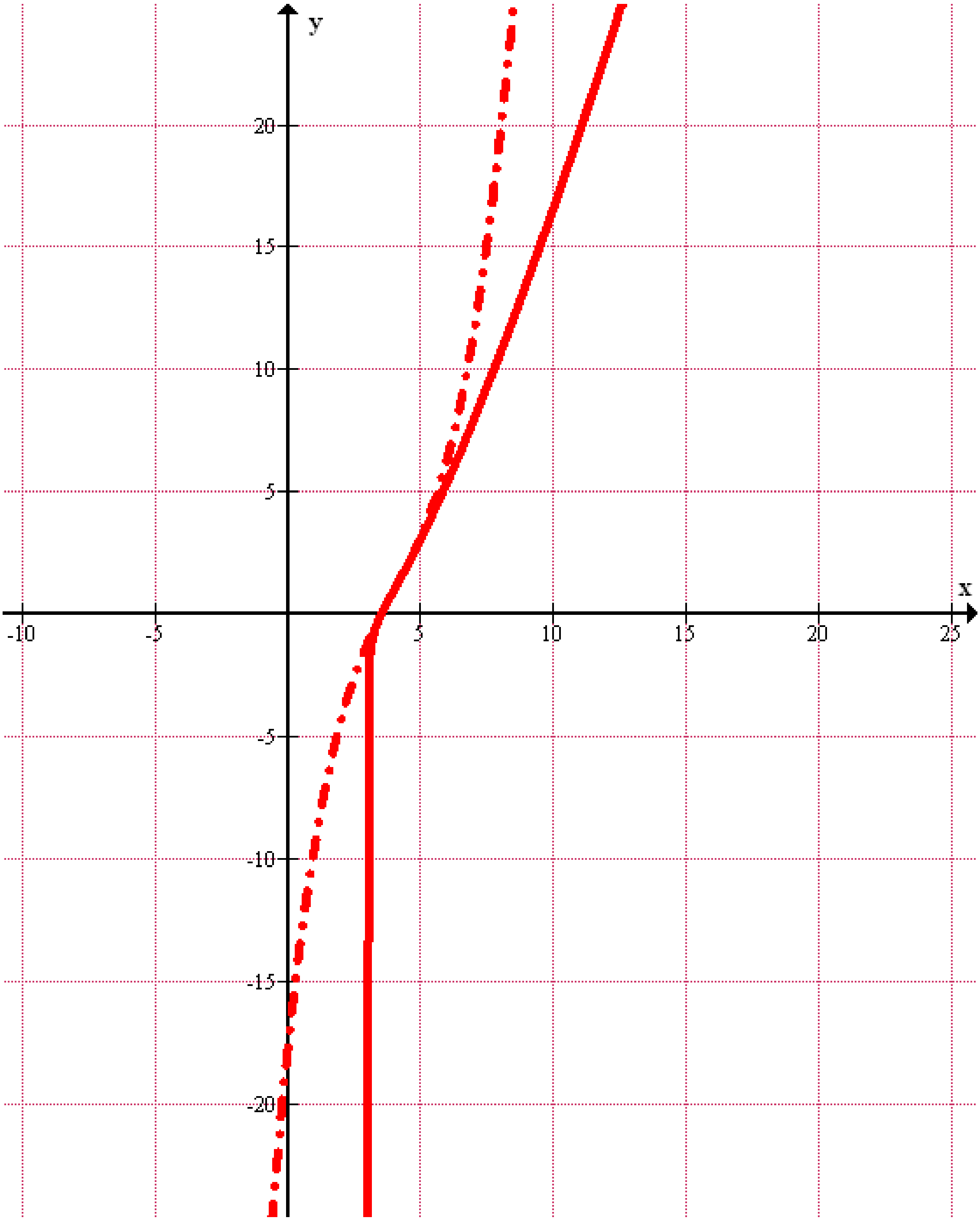
$f''(4) = \underline{\underline{0}}$

IV) $f'''(x) = \frac{(x-3)^2-(x-4)\cdot 2(x-3)}{(x-3)^4} = \frac{\cancel{(x-3)}\cdot[(x-3)-2(x-4)]}{(x-3)^{\cancel{4}}} = \frac{x-3-2x+8}{(x-3)^3} =$

$= \frac{5-x}{(x-3)^3}$ $\qquad f'''(4) = \frac{1}{1^3} = \underline{\underline{1}}$

T: $1+\frac{2}{1!}(x-4)^1+\frac{0}{2!}(x-4)^2+\frac{1}{3!}(x-4)^3 = \underline{\underline{1+2(x-4)+\frac{1}{6}(x-4)^3}}$

OBRÁZEK 1. Grafické znázornění funkce a jejího Taylorova polynomu 3. stupně



Zdroj: program Graph