Taylorův polynom 3. stupně

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

I) $f_{(4)} = 6 \cdot \ln 1 - 1 = \underline{\underline{-1}}$ $\qquad a = [4; -1]$

II) $f'_{(x)} = (1+0)\cdot \ln(x-3) + (x+2)\cdot \frac{1}{x-3} = \underline{\ln(x-3) + \frac{x+2}{x-3}}$

$f'_{(4)} = \ln 1 + \frac{6}{1} = \underline{\underline{6}}$

III) $f''_{(x)} = \frac{1}{x-3} + \frac{(x-3)-(x+2)}{(x-3)^2} = \frac{1}{x-3} + \frac{x-3-x-2}{(x-3)^2} = \frac{1}{x-3} + \frac{-5}{(x-3)^2} =$

$= \frac{(x-3)-5}{(x-3)^2} = \underline{\frac{x-8}{(x-3)^2}}$

$f''_{(4)} = \frac{-4}{1} = \underline{\underline{-4}}$

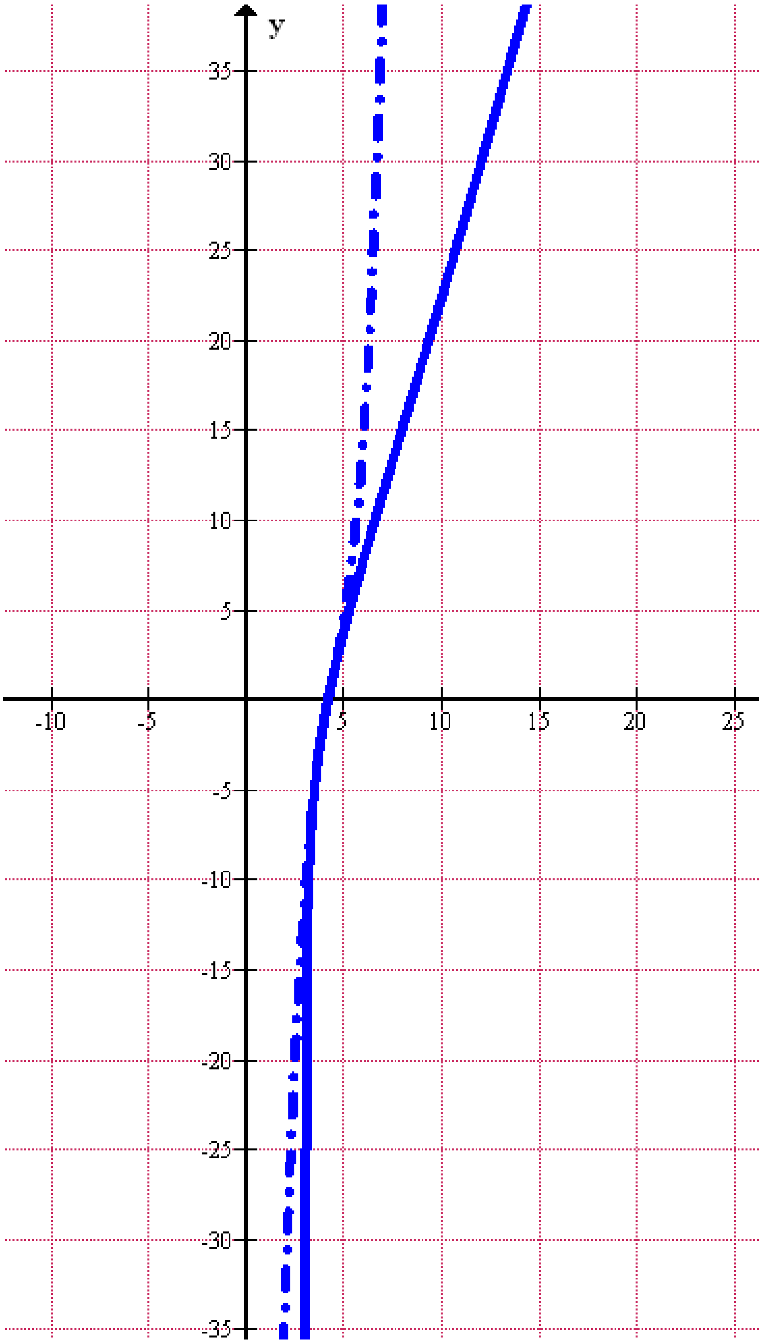
IV) $f'''_{(x)} = \frac{(x-3)^2 - (x-8)\,2(x-3)\cdot 1}{(x-3)^4} = \frac{(x-3)^2 - 2(x-8)(x-3)}{(x-3)^4}$

$f'''_{(4)} = \frac{1 - 2\cdot(-4)\cdot 1}{1} = 1 + 8 = 9$

T: $-1 + \frac{6}{1!}[x-4]^1 + \frac{-4}{2!}[x-4]^2 + \frac{9}{3!}[x-4]^3$

$\underline{\underline{-1 + 6(x-4) - 2(x-4)^2 + \frac{3}{2}(x-4)^3}}$

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



Zdroj: program Graph