PRÍKLAD 4: UROBME ODHAD M_2 PRE F-CIU

$$f(x)=\frac{1}{\sqrt{2x^2+0{,}3}} \quad \text{NA INTERVALE } \langle 0.7;\, 1.3\rangle$$

$$f(x)=(2x^2+0{,}3)^{-\frac{1}{2}}$$

$$f'(x)=-\frac{1}{\cancel{2}}(2x^2+0{,}3)^{-\frac{3}{2}}\cdot \overset{2}{\cancel{4}}x=\frac{-2x}{(2x^2+0{,}3)^{\frac{3}{2}}}$$

$$f''(x)=\frac{-2(2x^2+0{,}3)^{\frac{3}{2}}-(-\cancel{2}x)\cdot\frac{3}{\cancel{2}}(2x^2+0{,}3)^{\frac{1}{2}}\cdot 4x}{(2x^2+0{,}3)^3}=\frac{-2\sqrt{(2x^2+0{,}3)^3}+12x^2\cdot\sqrt{2x^2+0{,}3}}{(2x^2+0{,}3)^3}=$$

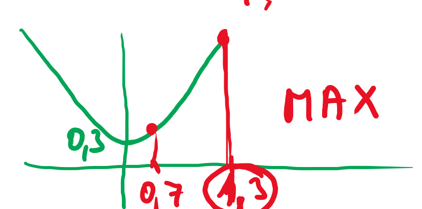
$$=\frac{-2\sqrt{2x^2+0{,}3}\left((2x^2+0{,}3)-6x^2\right)}{(2x^2+0{,}3)^3}=\frac{-2(0{,}3-4x^2)}{(2x^2+0{,}3)^{\frac{5}{2}}}=\frac{-2(0{,}3-4x^2)}{\sqrt{(2x^2+0{,}3)^5}}$$

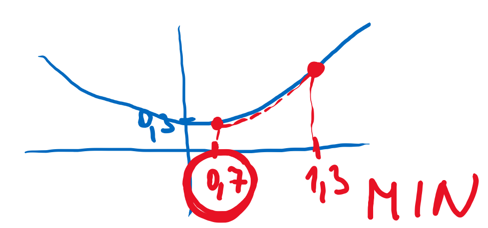
$$|f''(x)|=\left|\frac{-2\cdot(0{,}3-4x^2)}{\sqrt{(2x^2+0{,}3)^5}}\right|\leq\frac{|2|(|0{,}3|+|4x^2|)}{\left|\sqrt{(2x^2+0{,}3)^5}\right|}=\frac{2(0{,}3+4x^2)}{\sqrt{(2x^2+0{,}3)^5}} \quad (☼)$$

$x=1{,}3$ (v čitateli), $x=0{,}7$ (v menovateli)

Z MAT1 VIEME: $|a+b|\leq|a|+|b|$

$|a-b|\leq|a|+|b|$





KEĎŽE $M_2=\max\limits_{\langle a,b\rangle}|f''(x)|$; V NAŠOM ZLOMKU (☼) BUDEME ZA x DOSADZOVAŤ DO JEDNOTLIVÝCH ČASTÍ ZLOMKU TIE HODNOTY Z $\langle a,b\rangle$ KTORÉ NÁM VYTVORIA V ČITATELI ČO NAJVÄČŠIU HODNOTU A ZÁROVEŇ V MENOVATELI ČO NAJMENŠIU HODNOTU.

$$(☼)\leq\frac{2(0{,}3+4\cdot(1{,}3)^2)}{\sqrt{(2\cdot(0{,}7)^2+0{,}3)^5}}=7{,}61745$$