Taylorův polynom 3. stupni

$$f(x) = \frac{1}{x} + \sqrt{3+2x} \qquad a = -1$$

$F \cdot [-1;0]$

$$f(-1) = \frac{1}{-1} + \sqrt{1} = -1+1 = \underline{\underline{0}}$$

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

$$f'(-1) = \frac{1}{\sqrt{1}} - \frac{1}{1} = 1-1 = \underline{\underline{0}}$$

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

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

$$f''(-1) = \frac{2}{-1} - \frac{1}{1^{\frac{3}{2}}} = -2-1 = \underline{\underline{-3}}$$

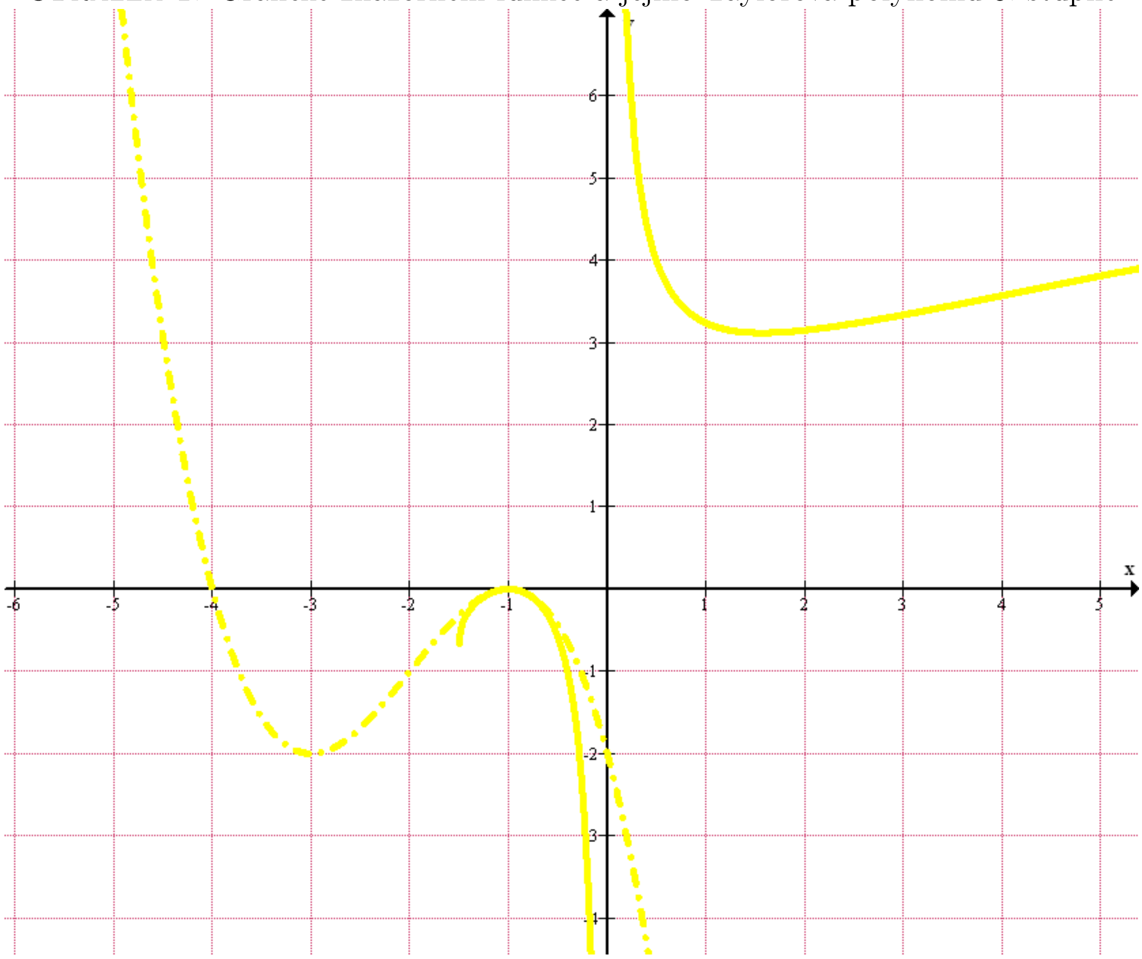
$$f'''(x) \; -6x^{-4} + \frac{3}{2}(3+2x)^{-\frac{5}{2}} \cdot 2$$

$$f'''(-1) = -6 + 3(3-2)^{-\frac{5}{2}} = -6+3 = \underline{\underline{-3}}$$

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

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

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



Zdroj: program Graph