$$f(x) = f(x_0) + (x-x_0) f'(x_0) + \frac{(x-x_0)^2}{2!} f''(x_0) +$$

$$+ \frac{(x-x_0)^3}{3!} f'''(x_0) + \cdots + \frac{(x-x_0)^{n+1}}{(n+1)!} f^{(n+1)}(x_0+\theta(x-x_0))$$

$$y = \frac{1}{2x+1} = (2x+1)^{-1} \to$$ као сложена функција $f(x)^n$

$$y' = -1(2x+1)^{-2} \cdot (2x+1)' = -(2x+1)^{-2} \cdot 2 = -\frac{2}{(2x+1)^2}$$

$$y'' = (-2) \cdot (-2)(2x+1)^{-3} \cdot 2 = +\frac{8}{(2x+1)^3}$$

$$y''' = 8 \cdot (-3)(2x+1)^{-4} \cdot 2 = -\frac{48}{(2x+1)^4}$$

$$f(x_0) = f(1) = \frac{1}{2 \cdot 1 + 1} = \frac{1}{3}$$

$$f'(x_0) = f'(1) = -\frac{2}{(2 \cdot 1 + 1)^2} = -\frac{2}{9}$$

$$f''(x_0) = f''(1) = \frac{8}{(2 \cdot 1 + 1)^3} = \frac{8}{27}$$

$$f'''(x_0) = f'''(1) = -\frac{48}{(2 \cdot 1 + 1)^4} = -\frac{48}{81}$$

остатак

$$f(x) = f(x_0) + (x-x_0) f'(x_0) + \frac{(x-x_0)^2}{2!} f''(x_0) + \frac{(x-x_0)^3}{3!} f'''(x_0) + R_4$$

$$f(x) = \frac{1}{3} + (x-1) \cdot \left(-\frac{2}{9}\right) + \frac{(x-1)^2}{2} \cdot \frac{8}{27} + \frac{(x-1)^3}{6} \cdot \left(-\frac{48}{81}\right) + R_4$$

$$\boxed{f(x) = \frac{1}{3} - \frac{2(x-1)}{9} + \frac{4(x-1)^2}{27} - \frac{8(x-1)^3}{81} + R_4}$$