

Taylorův polynom 3. stupně

$$f(x) = x^2 + 3 + e^{2x-1}$$

$$a = \frac{1}{2}$$

$$I) f\left(\frac{1}{2}\right) = \frac{1}{4} + 3 + e^0 = \frac{1+12+4}{4} = \frac{17}{4}$$

$$A = \left[\frac{1}{2}; \frac{17}{4} \right]$$

$$II) f'(x) = 2x + e^{2x-1} \cdot 2$$

$$f'\left(\frac{1}{2}\right) = 2 \cdot \frac{1}{2} + 2 \cdot e^0 = 1 + 2 = \underline{3}$$

$$III) f''(x) = 2 + 2e^{2x-1} \cdot 2$$

$$f''\left(\frac{1}{2}\right) = 2 + 4e^0 = \underline{6}$$

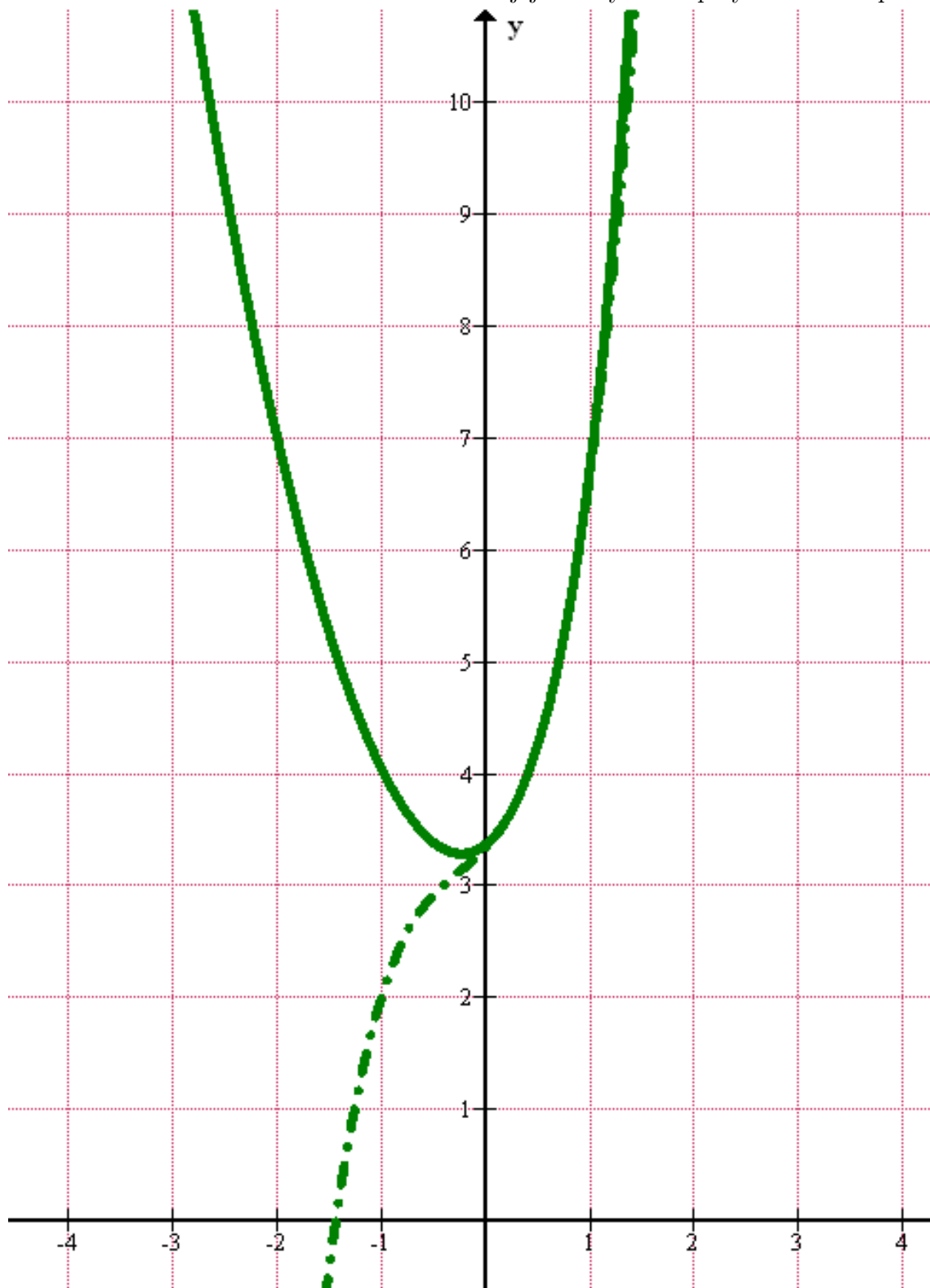
$$IV) f'''(x) = 4e^{2x-1} \cdot 2$$

$$f'''\left(\frac{1}{2}\right) = 8e^0 = \underline{8}$$

$$T: \frac{17}{4} + \frac{3}{1!} \left(x - \frac{1}{2}\right)^1 + \frac{6}{2!} \left(x - \frac{1}{2}\right)^2 + \frac{8}{3!} \left(x - \frac{1}{2}\right)^3 =$$

$$= \underline{\underline{\frac{17}{4} + 3\left(x - \frac{1}{2}\right) + 3\left(x - \frac{1}{2}\right)^2 + \frac{4}{3}\left(x - \frac{1}{2}\right)^3}}$$

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



Zdroj: program Graph