$$y(x) = 4+8x+8x^2+\frac{17}{2^2}\sum^{\infty}\frac{2^k x^k}{k} = 4+8x+8x^2+\frac{17}{2}\left(e^{2x}-1-2x-2x^2\right)$$

sima mo. $y' = 2y + x^2$

homogén: $y' = 2y \to \frac{y'}{y} = 2 \to \log(y) = 2x + C \to y = Ce^{2x}$

$$\underbrace{y'e^{-2x} - 2ye^{-2x}}_{(ye^{-2x})'} = x^2e^{-2x}$$

$$ye^{-2x} = \int \underset{f}{x^2}\,\underset{g'}{e^{-2x}} = -\frac{1}{2}x^2e^{-2x} + \int \underset{f}{2x}\,\underset{g'}{\left(\frac{1}{2}e^{-2x}\right)}dx =$$

$$= -\frac{1}{2}x^2e^{-2x} - \frac{1}{2}xe^{-2x} + \int \frac{1}{2}e^{-2x}dx = -\frac{1}{2}e^{-2x}\left(x^2-x\right) +$$

$$+\frac{1}{2}\cdot\left(-\frac{1}{2}\right)e^{-2x} + c$$

$$y = -\frac{x^2}{2} + \frac{x}{2} + \frac{1}{4} + c$$

próbafüggvény

Taylor-sor-módszer

$y' = 2y + x^2$, ha $x = 0$ $y'(0) = 2y(0) + 0 = 8$

deriváljuk DE-t és behelyettesítek 0-t

$$y'' = 2y' + 2x \xrightarrow[x=0]{} y''(0) = 16$$