ii) „Állandók variálása"

Keressük a most $y(x) = c(x) \cdot y_h(x)$ alakban

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

Behelyettesítve:

$$xy' + 2y = 3x^3$$

$$c'(x) \cdot x^{-1} + \underbrace{c(x) \cdot (-2)x^{-2} + 2c(x) \cdot x^{-2}}_{0} = 3x^3$$

$$c'(x) = 3x^4$$

$$c(x) = \frac{3}{5}x^5 + c_2$$

$$x^2 y = \frac{3}{5}x^5 + c_2 \rightarrow y = \frac{3}{5}x^3 + \frac{c_2}{x^2}$$

iii) próbafüggvény

$y_p = Ax^3$

próba/partikuláris

$y_p' = 3Ax^2$

$$xy_p' + 2y_p = 3Ax^3 + 2Ax^3 = 5Ax^3 = 3x^3 \rightarrow$$

$$\rightarrow A = \frac{3}{5} \rightarrow y_p = \frac{3}{5}x^3$$

és $y = y_h + y_p = \frac{c}{x^2} + \frac{3}{5}x^3$

5. $y' - \frac{1}{x\log(x)} y = x\log(x)$

$$y' - \frac{y}{x\log(x)} = 0 \rightarrow y' = \frac{y}{x\log(x)} \rightarrow \frac{y'}{y} = \frac{1}{x\log(x)} \Big/ \int \ldots$$

$$\log(y) = \log(\log(x)) + c$$

$$y_h = \log(x) \cdot c_2$$

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