# 5. Magasabbrendű differenciálegyenletek

I. Oldjuk meg a homogén állandó együtthatós differenciálegyenleteket.

| | | |
|---|---|---|
| *a)* | $y'' - 10y' + 29y = 0$ | $y(0) = 3 \quad y'(0) = 1$ |
| *b)* | $y'' + y = 0$ | $y(0) = 4 \quad y'(0) = 3$ |
| *c)* | $y'' - y = 0$ | $y(0) = 2 \quad y'(0) = -5$ |
| *d)* | $y''' - 6y'' + 11y' - 6y = 0$ | $y(0) = 0 \quad y'(0) = -3 \quad y''(0) = -23$ |
| *e)* | $y''' + y'' + y' + y = 0$ | $y(0) = 3 \quad y'(0) = 1 \quad y''(0) = 1$ |
| *f)* | $y''' - y'' - y' + y = 0$ | $y(0) = 0 \quad y'(0) = 0 \quad y''(0) = 2$ |
| *g)* | $\displaystyle\sum_{k=0}^{n} y^{(k)} = 0$ | |

II. Keressük meg az inhomogén másodfokú egyenletek megoldásait, ahol $\omega, k \in \mathbb{R}$ paraméterek.

| | | |
|---|---|---|
| *a)* | $y''(x) + 4y(x) = \sin^2 2x$ | $y(0) = 0 \quad y'(0) = 0$ |
| *b)* | $y''(x) - 4y(x) = xe^x$ | $y(0) = 0 \quad y'(0) = 0$ |
| *c)* | $y'''(x) = 12$ | $y''(1) = 0 \quad y'(1) = 0 \quad y(1) = 0$ |
| *d)* | $y''(x) + 2y'(x) + 2y(x) = \sin 2x + \cos 2x$ | $y'(0) = 1 \quad y(0) = 0$ |
| *e)* | $y''(x) + \omega^2 y(x) = kx^2$ | |
| *f)* | $y''(x) + \omega^2 y(x) = ke^{\beta x}$ | |
| *g)* | $y''(x) + \omega^2 y(x) = k \cos \beta x$ | |

5. Matematika A3, 2006.10.11., 1. lap, Andai Attila nyomán