Universidade do Minho
Dep. de Matemática e Aplicações



## edo's lineares de ordem $n$

Exercício 1.

(b) $y(x) = c_1 e^{2x} + c_2 e^{3x}, \quad c_1, c_2 \in \mathbb{R}$

(c) $y(x) = 3e^{2x} - e^{3x}$

Exercício 3.

(a) $y(x) = c_1 e^{-x} + c_2 e^{3x}, \quad c_1, c_2 \in \mathbb{R}$

(b) $y(x) = c_1 e^{-x} + c_2 e^{x} + c_3 e^{3x}, \quad c_1, c_2, c_3 \in \mathbb{R}$

(c) $y(x) = c_1 e^{4x} + c_2 x e^{4x}, \quad c_1, c_2 \in \mathbb{R}$

(d) $y(x) = c_1 e^{2x} + c_2 x e^{2x} + c_3 x^2 e^{2x}, \quad c_1, c_2, c_3 \in \mathbb{R}$

(e) $y(x) = c_1 e^{2x} \cos(3x) + c_2 e^{2x} \operatorname{sen}(3x), \quad c_1, c_2 \in \mathbb{R}$

(f) $y(x) = c_1 e^{x} + c_2 \cos(x) + c_3 \operatorname{sen}(x), \quad c_1, c_2, c_3 \in \mathbb{R}$

(g) $y(x) = e^{-\frac{\sqrt{2}}{2}x}\left(c_1 \cos\left(\frac{\sqrt{2}}{2}x\right) + c_2 \operatorname{sen}\left(\frac{\sqrt{2}}{2}x\right)\right) + e^{\frac{\sqrt{2}}{2}x}\left(c_3 \cos\left(\frac{\sqrt{2}}{2}x\right) + c_4 \operatorname{sen}\left(\frac{\sqrt{2}}{2}x\right)\right),$
$c_1, c_2, c_3, c_4 \in \mathbb{R}$

(h) $y(x) = (c_1 + c_2 x) \operatorname{sen}(x) + (c_3 + c_4 x) \cos(x), \quad c_1, c_2, c_3, c_4 \in \mathbb{R}$

Exercício 4. $y(x) = c_1 \operatorname{sen}(x) + c_2 \cos(x) + e^{-x}(c_3 \operatorname{sen}(2x) + c_4 \cos(2x)), \quad c_1, c_2, c_3, c_4 \in \mathbb{R}$

Exercício 5.

(a) $y(x) = e^{-3x} + 2e^{4x}$

(b) $y(x) = e^{2x}\,\mathrm{sen}\,(5x)$

Exercício 6. $y(x) = \dfrac{e^x - 2}{e - 2}$

Exercício 7.

(a) $y(x) = c_1e^x + c_2e^{2x} + 2x^2 + 6x + 7, \quad c_1, c_2 \in \mathbb{R}$

(b) $y(x) = c_1e^x + c_2e^{2x} - xe^x + \frac{1}{2}x + \frac{3}{4}, \quad c_1, c_2 \in \mathbb{R}$

(c) $y(x) = c_1e^x + c_2e^{2x} - xe^x - \frac{1}{2}x^2e^x, \quad c_1, c_2 \in \mathbb{R}$

(d) $y(x) = c_1e^x + c_2e^{2x} + 2e^{3x} - x^2e^x - 3xe^x + x^2 + 3x + \frac{7}{2}, \quad c_1, c_2 \in \mathbb{R}$

Exercício 8.

(a) $y(x) = 2e^{-x} + \frac{3}{2}e^{3x} - \frac{1}{2}e^x + 2\,\mathrm{sen}\,(x) - \cos(x)$

(b) $y(x) = 6\cos(x) - \mathrm{sen}\,(x) + 3x^2 - 6 + 2x\cos(x)$

Exercício 9.

(a) $y(x) = c_1e^x + c_2e^{2x} + xe^{2x} - \frac{1}{20}\,\mathrm{sen}\,(2x) + \frac{3}{20}\cos(2x), \quad c_1, c_2 \in \mathbb{R}$

(b) $y(x) = c_1e^{-2x} + c_2e^{2x} + c_3 - \frac{3}{8}x^2 - \frac{1}{3}e^x, \quad c_1, c_2, c_3 \in \mathbb{R}$

(c) $y(x) = c_1e^{x/2}\,\mathrm{sen}\,\left(\frac{\sqrt{7}x}{2}\right) + c_2e^{x/2}\,\cos\left(\frac{\sqrt{7}x}{2}\right) + x - \frac{3}{2}e^x, \quad c_1, c_2 \in \mathbb{R}$

(d) $y(x) = c_1e^{-2x} + c_2e^x + c_3e^{3x} - \frac{1}{6}xe^{2x} + \frac{1}{6}x^2 + \frac{5}{18}x + \frac{37}{108}, \quad c_1, c_2, c_3 \in \mathbb{R}$

(e) $y(x) = c_1e^x + c_2e^{-x}\,\mathrm{sen}\,(x) + c_3e^{-x}\cos(x) - \frac{4}{25}xe^x + \frac{1}{10}x^2e^x - \frac{1}{2}, \quad c_1, c_2, c_3 \in \mathbb{R}$