Ex. 4.3.5

2) $y^{(4)} - 3y''' - y'' + 3y' = 0 \quad (1)$

Equação característica:

$$r^4 - 3r^3 - r^2 + 3r = 0$$

$$\Leftrightarrow r(r^3 - 3r^2 - r + 3) = 0$$

$$\Leftrightarrow r(r-1)(r^2 - 2r - 3) = 0$$

	1	-3	-1	3
1		1	-2	-3
	1	-2	-3	$\boxed{0}$

$$\Leftrightarrow r = 0 \vee r - 1 = 0 \vee r^2 - 2r - 3 = 0$$

$$\Leftrightarrow r = 0 \vee r = 1 \vee r = \frac{2 \pm \sqrt{4 - 4\times 1\times(-3)}}{2}$$

$$\Leftrightarrow r = 0 \vee r = 1 \vee r = \frac{2 \pm 4}{2}$$

$$\Leftrightarrow r = 0 \vee r = 1 \vee r = -1 \vee r = 3$$

$e^{0x} = 1 \qquad e^{1x} \qquad e^{-1x} \qquad e^{3x}$

SFS

$$\{1, e^{x}, e^{-x}, e^{3x}\}$$

Solução geral de (1)

$$\boxed{y = C_1 + C_2 e^{x} + C_3 e^{-x} + C_4 e^{3x}}$$

$C_1, C_2, C_3, C_4 \in \mathbb{R}$