

ESERCIZI SULLE EQUAZIONI DIFFERENZIALI LINEARI A COEFFICIENTI  
COSTANTI SOLUZIONI

1.

$$y(x) = e^{-x} \sin(x) \quad (\text{a})$$

$$y(x) = \frac{\cos(x) + 2 \sin(x)}{5} - e^{-x} \frac{\cos(x) + 3 \sin(x)}{5} \quad (\text{b})$$

$$y(x) = \frac{(-50x^2 + 140x - 136) \cos(x) + (25x^2 - 20x - 2) \sin(x)}{125} + e^{-x} \frac{136 \cos(x) + 123 \sin(x)}{125} \quad (\text{c})$$

$$y(x) = e^x \frac{(2x - 1) \cos(x) + (2x - 2) \sin(x)}{16} + e^{-x} \frac{\cos(x) + 2 \sin(x)}{16} \quad (\text{d})$$

2.

$$y(x) = 1 \quad (\text{a})$$

$$y(x) = \frac{(76 - 17x) \cos(x) + (2 + 68x) \sin(x)}{289} - e^{-4x} \frac{15}{1156} - \frac{1}{4} \quad (\text{b})$$

3.

$$y(x) = \frac{3}{5} e^{2x} + \frac{2}{5} e^{-3x} \quad (\text{a})$$

$$y(x) = \frac{1}{20} e^{2x} + \frac{2}{135} e^{-3x} - \frac{18x^2 + 6x + 7}{108} \quad (\text{b})$$

$$y(x) = \frac{1}{5} e^{2x} - \frac{1}{80} e^{-3x} - \frac{4x + 3}{16} e^x \quad (\text{c})$$

$$y(x) = \frac{2x^2 - 10x + 2}{250} e^{2x} - \frac{1}{125} e^{-3x} \quad (\text{d})$$

4.

$$y(x) = \frac{\sqrt{3} + 3}{6} e^{(2-\sqrt{3})x} - \frac{\sqrt{3} - 3}{6} e^{(2+\sqrt{3})x} \quad (\text{a})$$

$$y(x) = -\frac{26\sqrt{3} + 45}{3} e^{(2-\sqrt{3})x} + \frac{26\sqrt{3} - 45}{3} e^{(2+\sqrt{3})x} + x^2 + 8x + 30 \quad (\text{b})$$

$$y(x) = -\frac{2\sqrt{3} + 3}{12} e^{(2-\sqrt{3})x} + \frac{2\sqrt{3} - 3}{12} e^{(2+\sqrt{3})x} - \frac{x - 1}{2} e^x \quad (\text{c})$$

$$y(x) = -\frac{\sqrt{3}}{18} e^{(2-\sqrt{3})x} + \frac{\sqrt{3}}{18} e^{(2+\sqrt{3})x} - \frac{x}{3} e^{2x} \quad (\text{d})$$

5.

$$y(x) = -\frac{\sin(2x)}{2} e^{2x} \quad (\text{a})$$

$$y(x) = \frac{-488 \cos(2x) + 191 \sin(2x)}{8450} e^{2x} + \frac{(455x + 244) \cos(x) - (260x + 158) \sin(x)}{4255} \quad (\text{b})$$

$$y(x) = \frac{2 \sin(x) - \sin(2x)}{6} e^{2x} \quad (\text{c})$$

$$y(x) = \frac{x \sin(2x)}{4} e^{2x} \quad (\text{d})$$

6.

$$y(x) = -\frac{\cos(x) + 2 \sin(x)}{2} e^x + \frac{x^3 + 3x^2 + 3x + 1}{2} \quad (\text{a})$$

$$y(x) = \frac{-2 \cos(x) + 11 \sin(x)}{25} e^x + \frac{(5x + 2) \cos(x) - (10x + 14) \sin(x)}{25} \quad (\text{b})$$

$$y(x) = \frac{-2 \cos(x) + \sin(x)}{16} e^x + \frac{(2x + 2) \cos(x) + (2x + 1) \sin(x)}{16} e^{-x} \quad (\text{c})$$

$$y(x) = \frac{-x \cos(x) + \sin(x)}{4} x e^x \quad (\text{d})$$