Gyakorló feladatok megoldásai - 4.
MA6213di

1. (a) $y = c_1 e^{-x} + c_2 e^{-2x}$

   (b) $y = e^x$

   (c) $y = c_1 e^x \cos x + c_2 e^x \sin x$

   (d) $y = \sqrt{2} e^{-(x-\pi/4)} \cos x + \sqrt{2} e^{-(x-\pi/4)} \sin x$

   (e) $y = c_1 e^{-x/3} + c_2 x e^{-x/3}$

   (f) $y = \dfrac{1}{2} \sin 2x$

   (g) $y = c_1 e^{2x} \cos 2x + c_2 e^{2x} \sin 2x$

   (g) $y = 7 e^{-2(x+1)} + 5x e^{-2(x+1)}$

2. $\alpha = -2$

9. (a) $y = c_1 e^{-x} \cos 2x + c_2 e^{-x} \sin 2x + \dfrac{3}{17} \sin 2x - \dfrac{12}{17} \cos 2x$

   (c) $y = \left(\dfrac{3}{10} x^2 + \dfrac{7}{25} x + \dfrac{189}{250} \right) \cos x + \left(-\dfrac{1}{10} x^2 + \dfrac{24}{25} x - \dfrac{227}{250} \right) \sin x + \dfrac{1}{5} e^{2x} + c_1 e^{-x} + c_2 e^{-1/2x}$

   (e) $y = x + \dfrac{1}{4} x \sin x - \dfrac{1}{4} x^2 \cos x + c_1 \sin x + c_2 \cos x$

   (g) $y = c_1 e^x + c_2 x e^x - \dfrac{1}{2} e^x \ln(1 + x^2) + x e^x \operatorname{arctg} x$

10. (a) $y = c_1 x + c_2 x^{-2}$

    (b) $y = c_1 x + c_2 x e^x$

    (c) $y = c_1 e^x + c_2 x$

    (d) $y = c_1 x^{-1/2} \sin x + c_2 x^{-1/2} \cos x$

11. (a) $y = c_1 + c_2 x^{-1}$

    (b) $y = c_1 x^2 + c_2 x^2 \ln x$

    (c) $y = c_1 x^{-3} + c_2 x^{-4}$

    (d) $y = 2 x^{3/2} - x^{-1}$

    (e) $y = 2 x^{-1/2} \cos(2 \ln x) - x^{-1/2} \sin(2 \ln x)$

11. $\alpha < 1$

12. $\alpha > 0$

14. (a) $y = c_1 e^x + c_2 x e^x + c_3 e^{-x}$

(b) $y = c_1 + c_2 x + c_3 e^x + c_4 e^{-x} + c_5 \cos x + c_6 \sin x$

(c) $y = c_1 + c_2 x + c_3 e^{2x} + c_4 x e^{2x}$

(d) $y = c_1 \cos x + c_2 \sin x + e^{\sqrt{3}x/2}\left(c_3 \cos \frac{1}{2}x + c_4 \sin \frac{1}{2}x\right) + e^{-\sqrt{3}x/2}\left(c_5 \cos \frac{1}{2}x + c_6 \sin \frac{1}{2}x\right)$

(e) $y = \cos x$