

1. The functions are independent for all real x .
2. The functions are independent for all real $x > 0$.
3. The functions are independent for all real $x > 0$.
4. $y = C_1 \exp\left(-\frac{5}{4}x\right) \cos\left(\frac{\sqrt{15}}{4}x\right) + C_2 \exp\left(-\frac{5}{4}x\right) \sin\left(\frac{\sqrt{15}}{4}x\right)$
5. $y = C_1 e^{3x} \cos(2x) + C_2 e^{3x} \sin(2x)$
6. $y = \frac{62}{15} - \frac{17}{15}e^{-5x} - \frac{5}{3}xe^{-5x}$
7. $y = \frac{22}{13}e^x + \frac{27}{13}e^{-2x} \cos(2x) + \frac{139}{104}e^{-2x} \sin(2x)$
8. $y = C_1 \cos(3x) + C_2 \sin(3x) + \frac{1}{2} \sin x$
9. $y = C_1 e^{\frac{1}{2}x} + C_2 e^{3x} + \left(-\frac{39}{4} + \frac{9}{2}x - \frac{3}{2}x^2\right) e^x$
10. $y = C_1 e^x + C_2 e^{-x} - \int_0^x e^t \sec(3t) dt + \int_0^x e^{-t} \sec(3t) dt$
11. $y = C_1 \cos x + C_2 \sin x - \ln |\csc x + \cot x| - 1$
12. $y = C_1 x^{-\frac{3}{4}} \cos\left(\frac{\sqrt{47}}{4} \ln x\right) + C_2 x^{-\frac{3}{4}} \sin\left(\frac{\sqrt{47}}{4} \ln x\right)$
13. $y = \frac{1}{x} (C_1 + C_2 \ln x + C_3 (\ln x)^2)$