



Differential Equations Assignment 12

Find the form for the particular solution y_p . Here y_c denotes the complementary solution and $g(x)$ is the right hand side of a linear differential equation with constant coefficients written in standard form.

1. $y_c = C_1 e^{-x} + C_2 e^{-2x}$ and $g(x) = 10$.
2. $y_c = C_1 + C_2 e^x$ and $g(x) = -3$.
3. $y_c = C_1 e^{-4x} + C_2 x e^{-4x}$ and $g(x) = 9 + e^{-4x}$.
4. $y_c = C_1 \cos(x) + C_2 \sin(x)$ and $g(x) = 3x \sin(x)$.
5. $y_c = C_1 + C_2 x + C_3 e^{6x}$ and $g(x) = 2 - \cos(x)$.
6. $y_c = C_1 \cos(x) + C_2 \sin(x) + C_3 x \cos(x) + C_4 x \sin(x)$ and $g(x) = (x - 5)^2$.
7. $y_c = C_1 + C_2 e^{5x}$ and $g(x) = 4 + e^{5x}$.
8. $y_c = C_1 \cos(3x) + C_2 \sin(3x)$ and $g(x) = e^{8x}$.
9. $y_c = C_1 e^x + C_2 e^{-x}$ and $g(x) = x^3 e^x$.
10. $y_c = C_1 \cos(2x) + C_2 \sin(2x) + C_3 x \cos(2x) + C_4 x \sin(2x)$ and $g(x) = x^2 + 1$.
11. $y_c = C_1 + C_2 x + C_3 x^2 + C_4 e^{3x}$ and $g(x) = 7 - e^{3x}$.



Solutions to Assignment 12

1. $y_p = A$

2. $y_p = Ax$

3. $y_p = A + Bx^2e^{-4x}$

4. $y_p = (Ax^2 + Bx)\sin(x) + (Cx^2 + Dx)\cos(x)$

5. $y_p = Ax^2 + B\cos(x) + C\sin(x)$

6. $y_p = Ax^2 + Bx + C$

7. $y_p = Ax + Bxe^{5x}$

8. $y_p = Ae^{8x}$

9. $y_p = (Ax^4 + Bx^3 + Cx^2 + Dx)e^x$

10. $y_p = Ax^2 + Bx + C$

11. $y_p = Ax^3 + Bxe^{3x}$