Class 2 : Rules for finding the Complementary Functions, Problems

Solve the following Linear Differential Equations:

1. $(D^3 - D^2 - 12\,D)y = 0$

Answer : $y = c_1 + c_2 e^{4x} + c_2 e^{-3x}$

2. $(D^4 + 2k^2D^2 + k^4)\,y = 0$

Answer : $y = (a + bx)\cos kx + (c + dx)\sin kx$

3. $(D^3 + 2D^2 - 5D - 6)y = 0$

Answer : $y = c_1 e^{-x} + c_2 e^{2x} + c_2 e^{-3x}$

4. $(D^4 + 101D^2 + 25)\,y = 0$

Answer : $y = (a\cos 5x + b\sin 5x) + (c\cos\left(\frac{x}{2}\right) + d\sin\left(\frac{x}{2}\right))$

5. $(D^3 - 2D^2 - 4D + 8)y = 0$

Answer : $y = (a + bx)e^{2x} + c\,e^{-2x}$

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