Supplemental Problems

Here is a list of supplemental problems for the section on undetermined coefficients. For each of these problems, determine a suitable form for $y_p(t)$. Do not evaluate the constants.

1. $(D^2+2D+2)^2(D-3)^3(D+2)y = t^4+3t^2+2te^{3t}$

2. $(D^2+2D+2)^2(D-3)^3(D+2)y = te^{-t}\cos t + e^{-t}\sin(2t)$

3. $D^4(D-5)^7(D+1)y = -3t + e^{4t}\sin t$

4. $D^4(D-5)^7(D+1)y = 5t^2e^{5t}$

5. $(D^2-2D+\frac{25}{4})^3(D^2+9)^2(D+3)^5(D-1)y = t^2e^{2t}+t^3e^{2t}\cos(5t)$

6. $(D^2-2D+\frac{25}{4})^3(D^2+9)^2(D+3)^5(D-1)y = t^2e^{t}+8\cos(3t)$

7. $(D^2-2D+\frac{25}{4})^3(D^2+9)^2(D+3)^5(D-1)y = -7e^{2t}\sin(3t)$