MAP 2302—Elementary Differential Equations
Some extra exercises on the Method of Undetermined Coefficients

In each case, find the *form* of a particular solution of the given differential equation. DO NOT try to find the numerical value of any undetermined coefficients you use. For each exercise, the answer should be expressed in terms of the independent variable given in that exercise, and should not include any unnecessary terms or coefficients.

(a) $y'' - 7y' + 12y = e^{-3t} + (20t^2 + 30)e^{4t} + 400e^{3t}\sin 4t + 5,000te^{3t}\cos 4t.$

(b) $y'' - 6y' + 13y = t^2e^{2t} + 32,611\, e^{3t}\cos 2t + \frac{1}{\pi}te^{3t}.$

(c) $y'' - y' - 2y = t\sin t + 10^{23}t^2e^{2t} + 48,000e^{2016t}$.

(d) $y'' - 6y' + 9y = 16e^{3x} + 3e^{3x}\cos(2x) + x^2e^x.$

(e) $y'' - 8y' + 16y = 2e^{4x}\cos x - 5e^x\sin 4x + (2x + 9)e^{4x} + 3 - 17e^{4x}\sin x.$

(f) $y'' - 4y' + 13y = \pi\cos 3t + \sqrt{23}\ te^{2t}\sin 3t + e^{2t}\cos 3t + 13t^2 - 52e^{2t}.$