

Phys 3010 Mathematical Physics Assignment 13

For the following problems, solve each by hand, without initial conditions. You can check your answers using Maple (highly recommended.)

1. $\frac{dx}{dt} + 5x = 4e^{-5t}$

2. $\frac{d^2x}{dt^2} + 8\frac{dx}{dt} + 16x = 100\sin(2t)$

3. $\frac{d^2x}{dt^2} - 6\frac{dx}{dt} + 5x = 4e^t$

4. $\frac{d^4x}{dt^4} - 7\frac{d^3x}{dt^3} + 9\frac{d^2x}{dt^2} + 27\frac{dx}{dt} - 54x = 30e^{3t}$ Hint: use Maple to find the roots of a quartic equation.

You can use either the solve() function or the factor() function.