

# MATH 213

## ASSIGNMENT NO. 3

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1. Find particular solutions of the following differential equations:

$$a) \dot{y}(t) + 10y(t) = 10e^{-0.10t}$$

$$b) (D+3)(D+4)(D+5)y(t) = 5e^{-3t}$$

$$c) (D+3)^3 y(t) = 5e^{-3t}$$

$$d) \ddot{y}(t) + 4y(t) = e^{-2t} + t$$

$$e) (D+2)(D^2+9)y(t) = e^{-2t} + t$$

$$f) (D+2)^2(D^2+9)y(t) = e^{-2t} + t$$

$$g) (D^2+9)^2 y(t) = 1 - 2t^2$$

2. For all parts of question 2 of the previous assignment, find particular solutions for the case where  $x(t) = 0.1e^{j\frac{100}{\sqrt{2}}t}$ .

3. The slope of a curve on the  $x$ - $y$  plane is given by  $2y + 3x^2$ . Find  $y$  as a function of  $x$ , given that the curve passes through the origin.

4. Repeat question 3 for the case where the slope of the curve is  $2y + 2e^{2x}$ , and the curve passes through the point  $(2, 0)$ .