

Math 250
Section: 4

Quiz 2
Fall 2007

Name: _____
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All work must be shown to receive full credit!

1. For each of the following differential equations find a suitable form for a particular solution. Do not compute the values of coefficients.

(a) $y'' + 2y' + y = t^2 + \cos(2t)$

$r^2 + 2r + 1 = 0 \Rightarrow r_{1,2} = -1$ solution to homogeneous eq -n:
 $y(t) = A e^{-t} + B t e^{-t}$ (neither term appears on the R.H.S.)

Particular solution:

$Y(t) = C_1 t^2 + C_2 t + C_3 + C_4 \cos(2t) + C_5 \sin(2t)$

(b) $y'' + 2y' + y = e^t + e^{-t}$

Solution to hom. eq -n: $y(t) = A e^{-t} + B t e^{-t}$

Note: e^{-t} appears on the R.H.S.

Particular solution:

$Y(t) = A e^t + B e^{-t} \cdot t \cdot t = A e^t + B t^2 e^{-t}$

(c) $y'' + y = \sin(t) + \sin(2t)$

$r^2 + 1 = 0 \Rightarrow r_{1,2} = \pm i$

Solution to hom. eq -n: $y(t) = e^{0t} [A \cos(t) + B \sin(t)] =$

$= A \cos(t) + B \sin(t)$

$\sin(t)$ appears on the R.H.S.

Particular solution:

$Y(t) = C_1 t \cdot \sin(t) + C_2 t \cdot \cos(t) + C_3 \sin(2t) + C_4 \cos(2t)$