MATH 3113 **Quiz** 2 Sep. 26, 2008

i) (10 Points) Let $y(x) = 3xe^x + 2$. Find a linear homogeneous constant coefficient differential equation whose solution is $y(x)$.

ii) (10 Points) Consider the differential equation

$$y'' - 4y' + 5y = xe^{2x}\cos(x).$$

Find the appropriate form of a particular solution y_p, but do not determine the values of the coefficients.

iii) (5 Points) The roots of the characteristic equation of a constant coefficient homogeneous differential equation are $2, 2, 0, 0, 0, 3 \pm 5i$. Find the general solution of this differential equation.