Homework Assignment 7 in MATH 308-Summer 2012 **due June 18, 2012**

Topics covered : *complex numbers; linear homogeneous equations of second order with constant coefficient: the cases of complex roots and repeated roots (section 3.3)*

1. Write the given expressions in the form $a + ib$:

   (a) $(3 + 4i)(4 + 3i)$

   (b) $\frac{3+4i}{4+3i}$

   (c) $e^{\frac{3\pi}{4}i}$;

   (d) $e^{(4-\frac{\pi}{3}i)}$.

2. Consider the differential equation $y'' + 4y' + 29y = 0$.

   (a) Find the general solution of this equation;

   (b) Find the solution of the equation with the initial conditions $y(-\frac{\pi}{2}) = 3$, $y'(-\frac{\pi}{2}) = -4$. Describe the behavior of the solution as $t \to +\infty$.