Homework Assignment #6 — Fall 2013 - MATH308

due Friday Sep 27 at the beginning of class

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

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

   (a) $(-2 + 3i)(3 - i)i$

   (b) $\frac{5+2i}{3+4i}$ (Hint: multiply both numerator and denominator by complex conjugate of the denominator)

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

   (d) $e^{(2013-\frac{5\pi}{6}i)}$.

   (e) $(1 - i)^8$

2. Consider the differential equation $4y'' + 16y' + 25y = 0$.

   (a) Find the general solution of this equation;

   (b) Find the solution of the equation with the initial conditions $y(\frac{2\pi}{3}) = -1$, $y'(\frac{2\pi}{3}) = -2$. Describe the behavior of the solution as $t \to +\infty$.