

# Math 4450: Homework 1

Due September 2, 2009

## Written problems

1. 1.1, 26
2. 1.3, 22

## Problems

1. Express the following in the forms  $a + ib$ ,  $\begin{bmatrix} a \\ b \end{bmatrix}$ ,  $re^{i\theta}$  and  $\begin{bmatrix} r \cos \theta & r \sin \theta \\ -r \sin \theta & r \cos \theta \end{bmatrix}$ .
  - (a)  $\frac{1}{(1+i)}$
  - (b)  $\left(\frac{2+i}{6i-(1-2i)}\right)^2$
  - (c)  $e^{e^i}$
  - (d)  $\frac{e^{i\theta} - e^{-i\theta}}{i(e^{i\theta} + e^{-i\theta})}$
2. Completely factor  $z^4 - 16$ .
3. 1.2: 8, 17
4. 1.3: 4, 8, 17
5. 1.4: 7, 11