CLASSICAL AND LINEAR ALGEBRA
MATH 1210 (WINTER 2011) TUTORIAL 4

Q1. Find *all* the solutions to the following equation. Write your answer in exponential form, graphically illustrating these solutions in the complex plane:

$$x^6 + 3\sqrt{2}(1+i) = 0$$

Q2. Solve the following equation and express your answer in polar form.

$$z^4 i = -2 - 2\,i.$$

Q3. Use DeMoivre's theorem, written in the form

$$(e^{\theta i})^n = e^{n\,\theta\,i}\,,$$

to prove the identities:

$$\sin(4\,\theta) = 4\,\cos^3\,\theta\,\sin\theta - 4\cos\theta\,\sin^3\,\theta, \quad \cos(4\,\theta) = \cos^4\theta - 6\,\cos^2\theta\,\sin^2\theta + \sin^4\theta.$$