MATH206 Homework #1

Due 28 February 2008

1. Find the principle arguments Arg$z$ of the following
   a. $(-1 + i2\sqrt{3})^5$
   b. $\dfrac{-5i}{1 - i\sqrt{2}}$
   c. $\dfrac{1 + i3}{-2 - i\sqrt{5}}$

   in radians using MATLAB.

2.
   a. Solve the equation $z^3 - (1 - 2i)z^2 - (21 + 25i)z - (124 + 32i) = 0$ using the **solve** function of MATLAB and verify your findings using MATLAB.
   b. Plot the roots of the equation $2z^8 - z^6 - z^4 + 3z^2 + 2 = 0$ by using **roots** function of MATLAB.

3. Write a MATLAB <u>function</u>* to find and plot the roots of the following
   a. $(-36)^{1/5}$
   b. $(-27\sqrt{3} - i27)^{1/8}$.

   * You should write a <u>function</u> which takes two inputs, namely the number and the degree of the root, and it will give the roots as outputs.

   Ex: FindRoots(z0,n) where $z = (z0)^{1/n}$.

4. Write a MATLAB script to map the triangular area whose vertices are at (0,0), (1,2i), and (1,-2i) by using the transformations
   a. $w = \exp(z)$
   b. $w = \sin(z)$

   and also plot the results in MATLAB.