Name: _____ **Quiz 1**

Math 434 Complex Variables – Crawford **18 February 2015**

Books, notes (in any form), and calculators are not allowed. *Show all your work.* Good Luck!

1. (8 pts) Given $z = (-2 - 2i)^3$.

(a). Find the principal argument $\operatorname{Arg} z$.

(b). Write z (the resulting product) in rectangular form.

2. (2 pts) TRUE OR FALSE: If $z_1 = 3e^{-i\pi/3}$ and $z_2 = \frac{1}{2}e^{i5\pi/3}$, then $\arg z_1 = \arg z_2$.

3. (8 pts) Given $-27i$,

(a). Find the cube roots $(-27i)^{1/3}$ and write the final answers in rectangular form.

(b). Exhibit the roots as the vertices of a specific regular polygon and indicate the principal root.

4. (2 pts) TRUE OR FALSE: The fourth roots of a complex number z can be written as c, cw_4, cw_4^2, cw_4^3 where $1, w_4, w_4^2, w_4^3$ are the 4^{th} roots of unity and c must be the principal root of z.