ECE 206 Advanced Calculus 2, Assignment 7 Due TBA

1: Express each of the following complex numbers in cartesian form.

(a) $(2+i)(3+2\,i)-(5+3\,i)$

(b) $\dfrac{1}{(\sqrt{2}+i)(1+i\sqrt{2})}$

(c) $\dfrac{(1+2\,i)^3}{(3+i)^2}$

2: Solve each of the following equations for $z \in \mathbf{C}$. Express your answers in cartesian form.

(a) $\dfrac{z+1}{z+i} = 3+i$

(b) $z^2 = \overline{z}$

(c) $z^2 = 4+3\,i$

3: Draw a picture of each of the following subsets of the plane.

(a) $\left\{z \in \mathbf{C} \middle| 1 < |z-1| \le \sqrt{5}\right\}$

(b) $\left\{z \in \mathbf{C} \middle| |z-2\,i| = |z-4|\right\}$

(c) $\left\{z \in \mathbf{C} \middle| |z| + |z-4| = 8\right\}$

4: Express each of the following complex numbers in cartesian form.

(a) $4\,e^{i\,5\pi/3}$

(b) $(1+i\sqrt{3})^{10}$

(c) $5\,e^{i\,\theta}$, where $\theta = \tan^{-1} 2$

5: Express each of the following complex numbers in the polar form $re^{i\,\theta}$.

(a) $-2+2i$

(b) $\dfrac{(1-i)^2}{(1+i\sqrt{3})}$

(c) $-3-i$