ECE 206 Advanced Calculus 2, Assignment 8 Due TBA

1: Solve each of the following for $z \in \mathbf{C}$.

(a) $z^3 + 8i = 0$

(b) $z^5 + 16\,\overline{z} = 0$

(c) $2i\,z = \dfrac{z + 2 - i}{z + 1}$

2: For each of the following polynomials $f(x)$, first solve $f(z) = 0$ for $z \in \mathbf{C}$, and then factor $f(x)$ over the real numbers.

(a) $f(x) = x^6 + 7x^3 - 8$

(b) $f(x) = x^6 + 1$

3: Let $x_1 = 1$ and $x_2 = 3$, and for $n \geq 3$ let $x_n = 4x_{n-1} - 5x_{n-2}$. Find a closed-form formula for x_n (your final answer should not involve complex numbers).

4: Solve each of the following for $x \in \mathbf{R}$. Express your answers using only real numbers.

(a) $8x^3 - 6x + 1 = 0$

(b) $x^3 + 3x^2 - 3x - 7 = 0$