Math 6490: Written Assignment 3
Due Thursday, April 8

1. Suppose $m = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$ and C is the imaginary axis $i\mathbb{R}$. Find the exact center and radius of all the circles $m^n(C)$.
   Hint: Find a formula for $m^n(\infty)$. Use that to locate the center of $m^n(C)$.

2. Suppose $T(z)$ satisfies
$$\frac{T(z)-1}{T(z)+1} = 2\,\frac{z-1}{z+1}.$$
   (a) Let C be the unit circle. Find the center and radius of $T^n(C)$ for all integers n.
   (b) Let C be the imaginary axis $i\mathbb{R}$. Find the center and radius of $T^n(C)$ for all integers n.