

Homework 12

1. Elaydi problem 2 page 186.
2. Elaydi problem 4 page 186.
3. Elaydi problem 6 page 186.
4. Elaydi problem 13 page 187.
5. Let $A = \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$. Prove that $A^n = \begin{bmatrix} F_{2n} & F_{2n-1} \\ F_{2n-1} & F_{2n-2} \end{bmatrix}$, where F_k denotes the k -th Fibonacci number.
6. Let T denote the two-dimensional torus, as defined in class.
 - (i) Prove that (T, ρ) is a metric space with the metric:
$$\rho([x_1, y_1], [x_2, y_2]) := \min\{|\tilde{x}_1 - \tilde{x}_2| + |\tilde{y}_1 - \tilde{y}_2|; (\tilde{x}_1, \tilde{y}_1) \approx (x_1, y_1) \text{ and } (\tilde{x}_2, \tilde{y}_2) \approx (x_2, y_2)\}.$$
 - (ii) Prove that every hyperbolic toral automorphism $L_A : T \rightarrow T$ is a continuous function.
7. Elaydi problem 6 page 206.