MATH 117, DYNAMICAL SYSTEMS
HOMEWORK #3

Exercises 4.15, 4.16, 4.17, 4.18, and the following problem:

Problem 1.

Let $f : \mathbb{T}^2 \to \mathbb{T}^2$ be a homeomorphism of the two-dimensional torus. For each of the following statements determine whether it must be true. If yes, prove it. If not, give a counterexample.

a) If for some points $x, y \in \mathbb{T}^2$ one has $\omega(x) \cap \omega(y) \neq \emptyset$, then $\omega(x) = \omega(y)$;

b) If $y \in \omega(x)$, then $\omega(y) \subset \omega(y)$;

c) If $x \in \omega(x)$, then for any $y \in \omega(x)$ one has $\omega(y) = \omega(x)$.