Assignment 6

The due date for submitting this assignment has passed.
As per our records, you have not submitted this assignment.

1) Suppose \((X, f)\) is a metric space and \((X, f)\) is a topologically transitive system, then:
   - \(X\) is finite then \(X\) will be the union of two or more disjoint orbits of periodic points
   - \(X\) is finite then \(X\) consists of the orbit of a single periodic point
   - \(X\) is an interval then the system contains a periodic point of period 5
   - \(X\) is an interval then the system contains a periodic point of period 24
   
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - If \(X\) is finite then \(X\) consists of the orbit of a single periodic point
   - If \(X\) is an interval then the system contains a periodic point of period 6
   - If \(X\) is an interval then the system contains a periodic point of period 24

2) Suppose \((I, f)\) is a dynamical system where \(I\) is an interval. If the set of periodic points is dense in \(I\) then:
   - \((I, f)\) will have sensitive dependence on initial conditions
   - \((I, f)\) will be topologically transitive
   - \((I, f)\) is topologically transitive then \((I, f)\) will have sensitive dependence on initial conditions
   - Further if \((I, f)\) will have sensitive dependence on initial conditions then \((I, f)\) is topologically transitive
   
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - \((I, f)\) is topologically transitive then \((I, f)\) will have sensitive dependence on initial conditions

3) Consider the map \(f: [0, 1] \rightarrow [0, 1]\) defined as \(f(x) = \begin{cases} 2x & \frac{1}{2} \leq x \leq 1 \\ \frac{1}{2} & \frac{1}{2} \leq x \leq 1 \end{cases}\) then:
   
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - The system is transitive
   - The system is not transitive
   - There is an uncountable set of periodic points
   - There is no eventually periodic other than the periodic points

4) Which of the following is a dynamical invariant?

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - Derivative of periodic points
   - Sensitivity
   - Topological Transitivity
   - None of the above

5) Which of the following is/are false:
   - Product of two transitive systems need not be a transitive system
   - Product of two transitive systems is always a transitive system
   - For two dynamical systems \((X, f)\) and \((Y, g)\), \(X \times Y \rightarrow f \circ g\) is transitive if and only if \(X = Y\)
   - For two dynamical systems \((X, f)\) and \((Y, g)\), \(X \times Y \rightarrow f \circ g\) is transitive if and only if \(X = Y\) and \(f = g\)

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - Product of two transitive systems need not be a transitive system
   - Product of two transitive systems is always a transitive system

6) Which of the following is/are true:
   - A weak mixing system is always minimal
   - A weak mixing system is always transitive
   - A minimal system is always weak mixing
   - A transitive system is always weak mixing
   - An equicontinuous system is always sensitive
   - An equicontinuous system is always sensitive

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - A weak mixing system is always transitive

7) Which of the following is/are true:

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - A weak mixing system is always sensitive
   - A minimal system is always sensitive
   - An equicontinuous system is always sensitive
   - An equicontinuous system is always sensitive