

Unit 14 - Week 12

Course outline

How does an NPTEL online course work?

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

• Chaos in Toral Automorphisms

• Chaotic Attractors of Henon Maps

○ Quiz : Assignment 12

○ Week 12 Feedback Form

Text Transcripts

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Assignment Solution

Assignment 12

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

Due on 2020-04-22, 23:59 IST.

1) For the Hyperbolic Toral automorphism $T : \mathbb{T}^2 \rightarrow \mathbb{T}^2$ as $T(x_1, x_2) = \begin{bmatrix} \frac{5}{2} & 3 \\ -\frac{1}{3} & 0 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} \pmod{1}$; 1 point

- $h(T) = 0$
- $h(T) = \log(\frac{1}{2})$
- $h(T) = \log(2)$
- $h(T) = 2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $h(T) = \log(2)$

2) For the Hyperbolic Toral automorphism $T : \mathbb{T}^2 \rightarrow \mathbb{T}^2$ as $T(x_1, x_2) = \begin{bmatrix} -4 & 1 \\ 13 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} \pmod{1}$; 1 point

- $h(T) > \log(7)$
- $h(T) = \log(7)$
- $h(T) = 0$
- $h(T) < \log(7)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $h(T) > \log(7)$

3) For the Henon map $H_{a,b} : \mathbb{R}^2 \rightarrow \mathbb{R}^2$; 1 point

- There is no attracting fixed point for $a = b = 3$
- There is exactly one attracting fixed point for $a = b = 3$
- All fixed points are attracting for $a = b = 3$
- All fixed points are attracting if $a < b$

No, the answer is incorrect.
Score: 0

Accepted Answers:
There is no attracting fixed point for $a = b = 3$

4) For the Henon map $H_{4,2} : \mathbb{R}^2 \rightarrow \mathbb{R}^2$; 1 point

- There is a fixed point which is not a source
- All fixed points are source
- There is a period two orbit
- All fixed points are real

No, the answer is incorrect.
Score: 0

Accepted Answers:
All fixed points are source
There is a period two orbit
All fixed points are real

5) Which of the following is/are true; 1 point

- p is an attracting fixed point of a Henon map $H_{a,b}$ if both eigen values of the Jacobian are of modulus greater than 1.
- p is an attracting fixed point of a Henon map $H_{a,b}$ if both eigen values of the Jacobian are of modulus less than 1.
- p is an attracting fixed point of a Henon map $H_{a,b}$ if only one of eigen values of the Jacobian is of modulus greater than 1.
- p is an attracting fixed point of a Henon map $H_{a,b}$ if only one of eigen values of the Jacobian is of modulus less than 1.

No, the answer is incorrect.
Score: 0

Accepted Answers:
 p is an attracting fixed point of a Henon map $H_{a,b}$ if both eigen values of the Jacobian are of modulus less than 1.