Unit 5 - Week 3

Assignment 3

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

Due on 2020-02-19, 23:59 IST.

1) Sensitive dependence on initial conditions is also called; *1 point*

- [ ] Butterfly effect
- [ ] Expansive
- [ ] Lyapunov unstable
- [ ] Minimal

No, the answer is incorrect.
Score: 0

Accepted Answers:
Butterfly effect
Lyapunov unstable

2) On [0, 1], the sensitivity constant of $f(x) = 2x \pmod 1$ is; *1 point*

- [ ] 1/2
- [ ] 1/4
- [ ] 3/4
- [ ] 1

No, the answer is incorrect.
Score: 0

Accepted Answers:
1/2
1/4
3/4
1

3) For the Logistic map $f(x) = \lambda x(1 - x)$, periodic point of period 2 will be there for; *1 point*

- [ ] $\lambda > -1$
- [ ] $\lambda > 2$
- [ ] $\lambda > 3$
- [ ] $\lambda < -1$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\lambda > -1$
$\lambda > 3$
$\lambda < -1$

4) The Lyapunov exponent of the map $f(x) = 4x^3 - 3x$ on [−1,1], n = 6, $x_0 = 0.1$, $e_0 = 0.01$ is; *1 point*

- ( ) 0.044
- ( ) -.044
- ( ) 0.44
- ( ) -0.44

No, the answer is incorrect.
Score: 0

Accepted Answers:
-.044

5) For the family $G_c(x) = c - x^2$, there is no fixed point for; *1 point*

- ( ) $c \leq \frac{1}{4}$
- ( ) $c < -\frac{1}{4}$
- ( ) $c < -\frac{3}{14}$
- ( ) $c \geq -\frac{3}{14}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$c < -\frac{1}{4}$

6) $\textbf{Let } f(x) = 2x \textbf{ on } [0,1]\textbf{ , } g(x) = x^2 - \frac{3}{4} \textbf{ on } [-\frac{3}{2}, \frac{3}{2}]\textbf{ , } h(x) = 3x(1-x) \textbf{ then;}$ *1 point*

- ( ) f (x) and g (x) are conjugate
- ( ) f (x) and h (x) are conjugate
- ( ) g (x) and h (x) are conjugate
- ( ) None of them is conjugate to the other

No, the answer is incorrect.
Score: 0

Accepted Answers:
g (x) and h (x) are conjugate

7) Which of the following maps possesses sensitive dependence on initial conditions; *1 point*

- [ ] $\text{On } [0, \frac{3}{4}],\ f(x) = \begin{cases} \frac{3}{2}x & 0 \leq x < \frac{1}{2} \\ \frac{3}{2}(1-x) & \frac{1}{2} \leq x \leq \frac{3}{4} \end{cases}$
- [ ] On [−1,1], $h(x) = 4x^3 - 3x$
- [ ] $\text{On } [0,1],\ f(x) = \frac{\pi}{2}$
- [ ] An irrational rotation on unit circle

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\text{On } [0, \frac{3}{4}],\ f(x) = \begin{cases} \frac{3}{2}x & 0 \leq x < \frac{1}{2} \\ \frac{3}{2}(1-x) & \frac{1}{2} \leq x \leq \frac{3}{4} \end{cases}$
On [−1,1], $h(x) = 4x^3 - 3x$