Unit 3 - Week 1

Assignment 1

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

Due on 2020-02-12, 23:59 IST.

Pick the correct options from each question. There is no negative marking.

1) Suppose T_α: $\mathbb{S}^1 \to \mathbb{S}^1$ an irrational rotation on unit circle $\mathbb{S}^1$ circle with irrational α. Then; *1 point*

- [ ] Every point is periodic point.
- [ ] Every orbit is infi nite.
- [ ] There are countably many periodic points.
- [ ] There is no periodic points.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Every orbit is infi nite.
There is no periodic points.

2) For the map $f : \mathbb{R} \to \mathbb{R}$ as $f(x) = \frac{1}{2}(x^3 + x)$. *1 point*

- ( ) $W^s(0) = (-3, 3)$.
- ( ) $W^s(1) = \{1\}$.
- ( ) $W^u(-1) = (-\infty, \frac{1}{2})$.
- ( ) $W^s(-1) = \{-1, +1\}$.

No, the answer is incorrect.
Score: 0

Accepted Answers:
$W^s(1) = \{1\}$.

3) For the map $f(\theta) = 2\theta$ on $\mathbb{S}^1$. *1 point*

- [ ] There are infi nitely many periodic points.
- [ ] There are fi nitely many periodic points.
- [ ] Backward orbit of every point converging to $\theta = 0$.
- [ ] There is no fixed point other than $\theta = 2n\pi$, $n \in \mathbb{Z}$.

No, the answer is incorrect.
Score: 0

Accepted Answers:
There are infi nitely many periodic points.
Backward orbit of every point converging to $\theta = 0$.
There is no fixed point other than $\theta = 2n\pi$, $n \in \mathbb{Z}$.

4) Consider the map $f(x) = x - x^2$ on the real line $\mathbb{R}$. *1 point*

- [ ] There are two periodic points.
- [ ] $W^s(0) = [0, 1)$.
- [ ] orbit of $-\frac{1}{2}$ is not convergent.
- [ ] There is no eventually periodic point.

No, the answer is incorrect.
Score: 0

Accepted Answers:
$W^s(0) = [0, 1)$.
orbit of $-\frac{1}{2}$ is not convergent.

5) Which of the following is/are true for the map f(x)= sinx on the whole real line $\mathbb{R}$ *1 point*

- [ ] 0 is the attracting fixed point.
- [ ] There is no eventually periodic point except 0.
- [ ] There is a periodic point $p \neq 0$.
- [ ] There is a point p whose forward orbit is dense in $(-\frac{\pi}{2}, \frac{\pi}{2})$.

No, the answer is incorrect.
Score: 0

Accepted Answers:
0 is the attracting fixed point.
There is no eventually periodic point except 0.

6) Which of the following is/are true for a hyperbolic periodic point p; *1 point*

- ( ) Always isolated.
- ( ) May not be isolated.
- ( ) Always non-isolated.
- ( ) p is always an attracting periodic point.

No, the answer is incorrect.
Score: 0

Accepted Answers:
May not be isolated.

7) Consider the quadratic map $f(x) = x^2 - \frac{3}{4}$ on $\mathbb{R}$. Then; *1 point*

- ( ) $-\frac{1}{2}$ is hyperbolic fixed point.
- ( ) $\frac{3}{2}$ is a repelling fixed point.
- ( ) There is no eventually periodic point.
- ( ) Every neighbourhood of $\frac{3}{2}$ lies within itself under every iteration of f.

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{3}{2}$ is a repelling fixed point.