Course outline

Week 9: Assignment 9

The due date for submitting this assignment has passed.

Due on 2021-09-29, 23:59 IST.

As per our records you have not submitted this assignment.

1) Which of these are true about limits of step functions on the interval $[a, b]$, $a, b \in \mathbb{R}$? *3 points*

- [ ] Any continuous function on $[a, b]$ is a uniform limit of step functions.
- [ ] Any differentiable function on $[a, b]$ is a uniform limit of step functions.
- [ ] Any continuous function on $[a, b]$ is a pointwise limit of step functions.
- [ ] Any function that is continuous outside a finite set of $[a, b]$ is a uniform limit of step functions.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Any continuous function on $[a, b]$ is a uniform limit of step functions.
Any differentiable function on $[a, b]$ is a uniform limit of step functions.
Any continuous function on $[a, b]$ is a pointwise limit of step functions.

2) Let I be an unbounded interval and $f : I \to \mathbb{R}$ be a function. *3 points*

- [ ] If $f \geq 1$ $a.e.$ then f cannot be Lebesgue integrable
- [ ] If $f|_{([-n,n]\cap I)}$ is in $L([-n, n] \cap I)$ for each $n \in \mathbb{N}$ then $f \in L(I)$.
- [ ] If $f \in L(I)$ then $f|_{([-n,n]\cap I)}$ is in $L([-n, n] \cap I)$ for each $n \in \mathbb{N}$
- [ ] If f is Lebesgue integrable then so is $|f|$.

No, the answer is incorrect.
Score: 0

Accepted Answers:
If $f \geq 1$ $a.e.$ then f cannot be Lebesgue integrable
If $f \in L(I)$ then $f|_{([-n,n]\cap I)}$ is in $L([-n, n] \cap I)$ for each $n \in \mathbb{N}$
If f is Lebesgue integrable then so is $|f|$.

3) Let $f, g : I \to \mathbb{R}$ be functions such that $f = g$ $a.e.$. Then *2 points*

- [ ] If f is Lebesgue integrable then so is g but the integrals need not coincide.
- [ ] If f is an upper function then so is g.
- [ ] If f is Riemann integrable then so is g.
- [ ] Either f and g are both Lebesgue integrable or neither are Lebesgue integrable.

No, the answer is incorrect.
Score: 0

Accepted Answers:
If f is an upper function then so is g.
Either f and g are both Lebesgue integrable or neither are Lebesgue integrable.