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Unit 2 - Sigma algebras, Measures and Integration

Course outline

How does an NPTEL online course work?

Sigma algebras, Measures and Integration

- Review of Riemann integration and introduction to sigma algebras (unit? unit=18&lesson=19)
- Sigma algebras and measurability (unit? unit=18&lesson=20)
- Measurable functions and approximation by simple functions (unit? unit=18&lesson=21)
- Properties of countably additive Processing math: 11%

Week 1 Assessment

The due date for submitting this assignment has passed. **Due on 2020-02-12, 23:59 IST.**
As per our records you have not submitted this assignment.

1) Let $f: [0, 1] \rightarrow \mathbb{R}$ be defined as follows:

1 point

$$f(x) = \begin{cases} 0 & \text{if } x \in \mathbb{Q} \\ 1 & \text{otherwise} \end{cases}$$

Then which of the following are true ?

- f is not Riemann integrable
- f is Riemann integrable
- Limit of upper sums of f is one
- Limit of lower sums of f is zero

No, the answer is incorrect.
Score: 0

Accepted Answers:
 f is not Riemann integrable
Limit of upper sums of f is one
Limit of lower sums of f is zero

2) Let $A_n, n = 1, 2, 3, \dots$ be a sequence of subsets of a set X .

1 point

Define \limsup

-
-

measures (unit?
unit=18&lesson=22)

Integration of positive measurable functions (unit?
unit=18&lesson=23)

Quiz : Week 1 Assessment (assessment? name=93)

Integration and convergence theorems

Outer measure

Lebesgue measure and its properties

Lebesgue measure and positive Borel measures on locally compact spaces

Lebesgue measure and invariance properties

L^p spaces and completeness

Product spaces and Fubini's theorem

Applications of Fubini's theorem and complex measures

Complex measures and Radon-Nikodym theorem

Radon-Nikodym theorem and applications

Riesz
Processing math: 11%
representation

No, the answer is incorrect.

Score: 0

Accepted Answers:

3) Let $\{E_n\}$ be a sequence of subsets of a set X . Define $F_n = \bigcup_{k=1}^n E_k$. Then, which of the following are always true? **1 point**

No, the answer is incorrect.

Score: 0

Accepted Answers:

4) Let E be a set and let $\{E_n\}$ be proper distinct subsets of E . Consider the sequence of sets $F_n = \bigcup_{k=1}^n E_k$. Which of the following are correct? **1 point**

Which of the following are correct?

No, the answer is incorrect.

Score: 0

Accepted Answers:

5) Which of the following are true? **1 point**

No, the answer is incorrect.

Score: 0

Accepted Answers:

For

6) Which of the following are true ? **1 point**

for any finite set

No, the answer is incorrect.

Score: 0

**theorem and
Lebesgue
differentiation
theorem**

**Weekly Feedback
forms**

Video download

Accepted Answers:

for any finite set

7) Which of the following are true ?

1 point

is generated by open balls of rational radii

is generated by closed balls of rational radii

is generated by singletons

is generated by

No, the answer is incorrect.

Score: 0

Accepted Answers:

is generated by open balls of rational radii

is generated by closed balls of rational radii

is generated by

8) Which of the following are algebras?

1 point

No, the answer is incorrect.

Score: 0

Accepted Answers:

9) Which of the following definitions give a measure on

1 point

if and otherwise

number of rationals in

number of rationals in

No, the answer is incorrect.

Score: 0

Accepted Answers:

if and otherwise

number of rationals in

10) Let \mathcal{L} and let \mathcal{L}^* be the powerset of \mathcal{L} and the counting measure on \mathcal{L}^* . Then which of the following are true?

1 point

Processing math: 11%



No, the answer is incorrect.

Score: 0

Accepted Answers:

Processing math: 11%