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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Measure Theory (course)

Announcements (announcements)

About the Course (https://swayam.gov.in/nd1_noc20_ma02/preview) Ask a Question (forum)

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Unit 4 - Outer measure

Course Week 3 Assessment outline The due date for submitting this assignment has passed. Due on 2020-02-19, 23:59 IST. How does an As per our records you have not submitted this assignment. **NPTEL** online course work? 1) Let F be a countable subset of \mathbb{R}^n then $m_*(F)$ equals 1 point Sigma algebras, Measures and 0 Integration Integration and ∞ convergence Any positive number theorems No, the answer is incorrect. Score: 0 Outer measure Accepted Answers: 0 Consequences of MCT, Fatou's 2) Which of the following are correct? 1 point lemma and DCT (unit? Any countable set is measurable unit=30&lesson=31) Any open set is measurable Rectangles in Rⁿ and some The set { $x \in \mathbb{R}$: $|e^x \sin x| > 1$ } is measurable properties (unit? No, the answer is incorrect. unit=30&lesson=32) Score: 0 Outer measure Accepted Answers: on Rⁿ (unit? Any countable set is measurable unit=30&lesson=33) Any open set is measurable The set { $x \in \mathbb{R}$: $|e^x \sin x| > 1$ } is measurable Properties of outer measure 3) Which of the following sets are Borel sets? 1 point

on R^n (unit?		
unit=30&lesson=34)	The subset of $[0, 1]$ whose decimal expansions starts with 2	
measurable sets	Subsets of ${\mathbb R}$ whose complements are countable	
and Lebesgue	No, the answer is incorrect.	
measure on R ^A n	Score: 0	
(unit? unit=30&lesson=35)	Accepted Answers:	
um=00010330m=00)	The subset of $\left[0,1 ight]$ whose decimal expansions starts with 2	
Quiz : Week 3	Subsets of ${\mathbb R}$ whose complements are countable	
Assessment		
(assessment?	4) The outer measure of the set $\{0\} imes [-1,1] \subset \mathbb{R}^2$ is	1 point
name=95)		
	0	
Lebesgue	1	
measure and its	2	
properties		
	No, the answer is incorrect.	
Lebesgue	Score: 0	
measure and	Accepted Answers:	
positive Borel	0	
measures on	5) Let $E \subset \mathbb{R}^n$ be an unbounded set.	1 point
locally compact	-,	1
spaces		
	Outer measure of E is infinity	
Lebesgue		
measure and	Outer measure of E is positive, but need not be infinity always	
invariance		
properties	There are unbounded sets whose outer measure is zero	
	No, the answer is incorrect.	
L^p spaces and	Score: 0	
completeness	Accepted Answers:	
	There are unbounded sets whose outer measure is zero	
Product spaces	(i) Let $E \subset \mathbb{D}^n$ be such that $w(E) = 0$. Let Q be the energy set	4
and Fubini's	6) Let $E \subset \mathbb{R}^n$ be such that $m_*(E) = 0$. Let O_k be the open set	1 point
theorem	$O_k = \{y \in \mathbb{R}^n : d(y, E) < \frac{1}{k}\}$ where $d(y, E) = \inf_{x \in E} x - y $.	
Applications of		
Fubini's theorem	$m_*(O_k) = \infty$ always	
and complex		
measures	$m_*(O_k)$ is finite always	
mououroo		
Complex	$m_*(O_k)$ is positive always	
Complex measures and	$m_*(O_k)$ is positive always	
Radon-Nikodym	No, the answer is incorrect.	
theorem	Score: 0	
lieorem	Accepted Answers:	
Padan Nikadum	$m_*(O_k)$ is positive always	
Radon-Nikodym	7) Let $E \subset \mathbb{R}^n$ be such that $m_*(E) = 0$ and Let O_k be the open set	1 point
theorem and	$O_k = \{y \in \mathbb{R}^n : d(y, E) < \frac{1}{k}\}$ where $d(y, E) = \inf_{x \in E} x - y $. Then the statement	F 2
applications		
Dise	$m_*(O_k) o 0$ is	
Riesz		
representation	True always	
theorem and		
Lebesgue	True if E is closed	
differentiation		
theorem	True if E is bounded	

Weekly Feedback forms

Video download

True if E is compact No, the answer is incorrect. Score: 0 Accepted Answers: True if E is compact

8) Let $E \subset \mathbb{R}^n$ and $x \in \mathbb{R}^n$. Define $E + x = \{y + x : y \in E\}$. Suppose $m_*(E) = 0$. **1** point Which of the following are correct?

 $m_*(E+x) = 0.$ E + x is measurable E + x need not be measurable No, the answer is incorrect. Score: 0 Accepted Answers: $m_*(E+x) = 0.$ E + x is measurable 9) Let $A_n = \{n\} \times [-n, n] \subset \mathbb{R}^2$. If $A = \bigcup_{n=1}^{\infty} A_n$, then 1 point $m_*(A) = 0$ $m_*(A) = \infty$ $0 < m_*(A) < \infty$ No, the answer is incorrect. Score: 0 Accepted Answers: $m_*(A) = 0$ 10) Let A = [0, 1]. Which of the following are correct? 1 point $m_*(A) = \inf\{m_*(O) : A \subset O, O \text{ open }\}$ $m_*(A) = \sup\{m_*(K) : K \subset A, K \text{ compact }\}$ No, the answer is incorrect. Score: 0 Accepted Answers: $m_*(A) = \inf\{m_*(O) : A \subset O, O \text{ open }\}$ $m_*(A) = \sup\{m_*(K) : K \subset A, K \text{ compact }\}$