continuous math vs discrete math

Continuous Math vs Discrete Math: Understanding the Core Differences and Applications

continuous math vs discrete math is a topic that often sparks curiosity among students, educators, and professionals alike. At first glance, these two branches of mathematics might seem like simply different categories, but they represent fundamentally distinct ways of thinking about numbers, structures, and problems. Whether you're diving into calculus or exploring graph theory, understanding the difference between continuous and discrete math is essential for grasping the tools and techniques that apply best to various real-world scenarios.

What Is Continuous Math?

Continuous mathematics deals with quantities that can vary smoothly and without interruption. It is the study of objects that can take on any value within a given range, often represented by real numbers. Think about measuring time, distance, or temperature — these quantities change in a continuous fashion, where there are infinitely many possible values between any two points.

Key Concepts in Continuous Math

Some of the fundamental areas within continuous math include:

- **Calculus:** The study of change and motion, encompassing derivatives and integrals.

- **Real Analysis:** Focused on properties of real numbers and functions, including limits and continuity.

- **Differential Equations:** Equations involving derivatives that describe various physical phenomena.

- **Linear Algebra:** Deals with continuous vector spaces and transformations.

These concepts allow mathematicians and scientists to model dynamic systems like fluid flow, electromagnetic fields, and even financial markets, where values shift in a seamless manner.

Understanding Discrete Math

On the flip side, discrete mathematics explores structures that are fundamentally separate or distinct. Instead of dealing with smooth changes, discrete math works with countable, often finite, sets of objects. This branch is crucial for computer science, logic, and combinatorics, as it helps analyze systems that are built from distinct units or elements.

Core Topics in Discrete Math

Discrete math encompasses topics such as:

- **Graph Theory:** The study of networks and relationships between nodes and edges.

- **Combinatorics:** Counting and arrangement of discrete objects.

- **Logic:** Formal reasoning and proof techniques.

- **Number Theory:** Properties of integers and their relationships.

- **Algorithms and Complexity:** Understanding computational processes and their efficiency.

These areas enable problem-solving in domains like cryptography, scheduling, data structures, and more where discrete units and logical steps dominate.

Continuous Math vs Discrete Math: Core Differences

When comparing continuous math vs discrete math, several fundamental distinctions emerge, shaping how each field approaches problems and models reality.

Nature of the Elements

Continuous math deals with real numbers and continuous variables, meaning values can be infinitely divided and take on any number within an interval. For example, between 1 and 2, there are infinitely many numbers like 1.1, 1.01, 1.001, and so forth.

Discrete math, on the other hand, works with countable items such as integers, graphs, or logical statements. You can't have "half" a graph node or a fractional logical statement — the elements are distinct and separate.

Types of Problems Addressed

Continuous mathematics often handles problems involving rates of change, optimization, and modeling natural phenomena. For instance, calculating the trajectory of a rocket or the spread of heat through a metal rod involves continuous variables.

Discrete mathematics is better suited for problems that involve selection, arrangement, or logical inference. Tasks like designing a network, encrypting information, or scheduling tasks fall under this scope.

Mathematical Tools and Techniques

The techniques in continuous math include limits, integrals, differentiation, and infinite series. These tools help understand smooth curves, surfaces, and evolving systems.

In contrast, discrete math uses counting methods, graph traversal algorithms, modular arithmetic, and logical deduction. It often involves proofs by induction or contradiction and algorithmic thinking.

Applications and Real-World Examples

Where Continuous Math Shines

Continuous mathematics is crucial in fields like physics, engineering, and economics. Some practical applications include:

- **Physics:** Modeling motion, electromagnetism, and quantum mechanics.

- **Engineering:** Designing control systems, fluid dynamics, and signal processing.

- **Economics:** Calculating marginal costs, growth rates, and optimizing resources.

- **Biology:** Modeling population growth and biochemical reactions.

These applications demand a precise understanding of continuously varying quantities.

Discrete Math in Action

Discrete mathematics plays a pivotal role in computer science, telecommunications, and cryptography. For example:

- **Computer Science:** Algorithms, data structures, and database theory are built on discrete concepts.

- **Network Design:** Graph theory helps in optimizing routes and connections.

- **Cryptography:** Number theory and combinatorics secure communications.

- **Logic and Artificial Intelligence:** Formal logic underpins programming languages and automated reasoning.

Without discrete math, the digital world as we know it wouldn't exist.

Bridging the Gap: Where Continuous and Discrete Math Intersect

While continuous math vs discrete math often emphasizes their differences, it's important to recognize that many modern problems require a blend of both. For example, numerical analysis uses discrete approximations to solve continuous problems by breaking down continuous domains into discrete points.

Machine learning algorithms often use discrete data but rely on continuous optimization techniques like gradient descent. Similarly, digital signal processing converts continuous signals into discrete data for analysis and reconstruction.

This intersection highlights the complementary nature of these mathematical fields rather than positioning them as opposites.

Tips for Students Navigating Both

If you're a student or enthusiast trying to understand continuous math vs discrete math, here are some helpful pointers:

1. **Identify the Nature of the Problem:** Determine whether the problem involves continuous variables or distinct elements.

2. **Choose Appropriate Tools:** Use calculus and analysis for continuous domains; rely on combinatorics and logic for discrete settings.

3. **Practice Diverse Problems:** Exposure to both fields sharpens problem-solving skills across a wide range of scenarios.

4. **Explore Interdisciplinary Applications:** Recognize how combining both areas can

yield powerful solutions in technology and science.

Understanding when to apply continuous or discrete methods can make learning math more intuitive and practical.

Why Continuous Math vs Discrete Math Matters Today

In our increasingly data-driven and technological world, the distinction between continuous and discrete mathematics is more relevant than ever. From developing algorithms that power artificial intelligence to modeling the physical universe, these two branches underpin much of the innovation shaping our future.

Moreover, industries such as finance rely on continuous models for predicting markets, while computer science depends heavily on discrete structures for designing software and hardware. Recognizing the strengths and limitations of each approach allows professionals to apply the right mathematical framework and avoid costly mistakes.

Whether you're coding a new app, studying natural phenomena, or working on cryptographic protocols, appreciating the nuances of continuous math vs discrete math equips you with a deeper understanding and sharper analytical skills.

Exploring continuous math vs discrete math reveals not just contrasting theories, but also the beauty of how mathematics adapts to describe every facet of our complex world. By embracing both, we unlock the full potential of mathematical reasoning and problem solving.

Frequently Asked Questions

What is the main difference between continuous math and discrete math?

Continuous math deals with continuous variables and phenomena, such as calculus and real analysis, focusing on quantities that can vary smoothly. Discrete math studies distinct and separate values, like integers, graphs, and logic, emphasizing countable or finite structures.

Which fields heavily rely on continuous mathematics?

Fields such as physics, engineering, economics, and any area involving modeling of real-world phenomena with continuous change rely heavily on continuous mathematics,

including calculus, differential equations, and real analysis.

Why is discrete math important in computer science?

Discrete math is fundamental to computer science because it deals with countable structures such as algorithms, data structures, logic, graph theory, and combinatorics, which are essential for programming, cryptography, and network design.

Can continuous math concepts be applied in discrete math problems?

Yes, some continuous math concepts, such as probability theory and optimization, can be adapted or extended to solve discrete math problems, especially in fields like combinatorial optimization and discrete probability.

How do the teaching approaches differ for continuous math vs discrete math?

Continuous math teaching often focuses on limits, derivatives, and integrals with a strong emphasis on analytical techniques, while discrete math teaching emphasizes logical reasoning, proofs, counting methods, and algorithmic thinking.

Additional Resources

Continuous Math vs Discrete Math: A Detailed Comparative Review

continuous math vs discrete math is a foundational topic in the field of mathematics, often sparking debate among students, educators, and professionals about their differences, applications, and relevance. Both branches serve distinct purposes and contribute uniquely to various scientific and technological disciplines. Understanding their nuances is essential for anyone pursuing studies or careers in mathematics, computer science, engineering, or related fields.

Defining Continuous Math and Discrete Math

Continuous mathematics deals primarily with structures that can vary smoothly and assume any value within a given range. It is concerned with concepts such as calculus, real analysis, differential equations, and continuous probability distributions. This branch assumes that the variables involved are continuous, meaning they can take infinitely many values within an interval.

Discrete mathematics, in contrast, focuses on countable, distinct elements. It explores topics like graph theory, combinatorics, logic, set theory, and discrete probability. Discrete math is pivotal when dealing with objects that are separate and unconnected, such as integers, graphs, or finite sets.

Core Differences Between Continuous and Discrete Math

At its core, the continuous math vs discrete math debate centers on the nature of the objects being studied:

- **Nature of Values:** Continuous math involves variables that can take any value within a continuum, whereas discrete math deals with variables restricted to distinct, often integer values.

- **Mathematical Tools:** Continuous mathematics relies heavily on calculus and analysis, using limits, derivatives, and integrals. Discrete math utilizes combinatorial methods, algorithms, and logical reasoning.

- **Applications:** Continuous math is instrumental in physics, engineering, and fields requiring modeling of physical phenomena. Discrete math is foundational in computer science, cryptography, and network theory.

Applications and Practical Implications

Understanding the applications of continuous and discrete mathematics highlights their distinctive roles.

Continuous Mathematics in Real-World Contexts

Continuous mathematics is indispensable in areas where change is smooth and unbroken:

- **Engineering:** Calculus and differential equations model systems like electrical circuits, mechanical vibrations, and fluid dynamics.

- **Physics:** From classical mechanics to quantum theory, continuous math helps describe the behavior of particles and waves.

- **Economics:** Continuous models analyze trends, optimize functions, and study market behaviors over time.

Its reliance on concepts such as limits and infinitesimals allows scientists to predict and manipulate natural phenomena with precision.

Discrete Mathematics in Technological and Logical Domains

Discrete mathematics underpins many modern technological advances:

- **Computer Science:** Algorithms, data structures, and complexity theory are built on discrete principles.

- **Cryptography:** Secure communication relies on number theory and combinatorics, both discrete subjects.

- **Network Analysis:** Graph theory models social networks, internet topology, and transportation routes.

Because discrete math deals with distinct entities, it is suited to digital systems and logical processes where information is quantized.

Comparative Features: Continuous Math vs Discrete Math

A closer look at specific features reveals subtle but critical distinctions:

Continuity and Change

Continuous math assumes a smooth transition between values, making it ideal for modeling phenomena where small changes accumulate continuously. Discrete math, however, handles situations where change happens in jumps or steps, such as switching states in a computer program.

Mathematical Operations and Reasoning

In continuous math, differentiation and integration are central operations, enabling the study of rates of change and accumulation. Discrete math emphasizes counting techniques, recurrence relations, and logical inference, which are crucial for algorithm design and verification.

Visualization and Interpretation

Continuous mathematics often leverages graphs of smooth curves and surfaces, helping visualize gradual variations. Discrete mathematics typically uses diagrams like graphs with nodes and edges, illustrating relationships between distinct objects.

Educational Perspectives on Continuous vs Discrete Math

The educational journey through these two branches reflects their differing nature.

Curriculum Structure

Traditionally, continuous mathematics forms the backbone of early university mathematics education, with courses in calculus and linear algebra. Discrete mathematics often appears later, especially in computer science programs, emphasizing problem-solving and logical thinking skills.

Learning Challenges

Students often find continuous math abstract due to its reliance on limits and infinite processes. Discrete math, while more concrete, demands rigorous logical reasoning and familiarity with combinatorial concepts, which can be equally challenging.

Interdisciplinary Relevance

Both branches increasingly overlap. For instance, numerical methods apply discrete techniques to solve continuous problems, and discrete models approximate continuous systems in computer simulations.

Pros and Cons of Continuous and Discrete Mathematics

While both fields are indispensable, they come with unique advantages and limitations.

Continuous Mathematics

- **Pros:** Provides precise modeling of natural phenomena; extensive theoretical foundation; essential for physics and engineering.

- **Cons:** Can be mathematically intensive; sometimes less practical for digital computation; involves complex concepts like limits and infinities.

Discrete Mathematics

- **Pros:** Highly applicable to computing and information technology; often more intuitive due to finite structures; crucial for algorithm development.

- **Cons:** Less suited for modeling continuous systems; can require deep combinatorial insight; sometimes isolated from classical mathematics traditions.

Bridging the Gap: Synergies and Hybrid Approaches

The boundary between continuous math and discrete math is not always rigid. Many modern problems require a hybrid approach:

- **Numerical Analysis:** Uses discrete approximations to solve continuous problems.

- **Signal Processing:** Combines continuous signals with discrete sampling techniques.

- **Computational Geometry:** Applies discrete algorithms to tackle problems in continuous spaces.

This synergy reflects the evolving landscape of mathematics, where the interplay between continuous and discrete methodologies drives innovation.

In exploring continuous math vs discrete math, it becomes clear that both are pillars of mathematical science, each tailored to different types of problems and applications. Their complementary nature enriches fields as diverse as artificial intelligence, physics, and economics, demonstrating the enduring significance of understanding their distinct yet interconnected roles.

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continuous math vs discrete math: Key Concepts in Discrete Mathematics Udayan Bhattacharya, 2025-02-20 Key Concepts in Discrete Mathematics offers a comprehensive introduction to the fascinating realm of discrete mathematics, covering a diverse array of topics essential for students and professionals in computer science, mathematics, engineering, and related fields. Through clear explanations, illustrative examples, and engaging exercises, we provide readers with a solid foundation in discrete mathematics and its practical applications. Our book covers a wide range of topics, from fundamental concepts like sets, relations, and functions to advanced topics such as graph theory, combinatorics, and algorithm analysis. We present complex concepts in a clear and accessible manner, with detailed explanations and step-by-step examples guiding readers through each topic. We emphasize practical applications and real-world examples that demonstrate the relevance of discrete mathematics in various fields, including computer science, cryptography, network theory, and optimization. Abundant exercises and problems, ranging from basic to challenging, allow readers to practice and reinforce their understanding of key concepts and techniques. Additional online resources, including solutions to selected exercises, interactive quizzes, and supplementary materials, enhance the learning experience and provide opportunities for further exploration. Whether used as a textbook in a classroom setting or as a self-study guide, Key Concepts in Discrete Mathematics serves as an invaluable resource for students seeking to deepen their understanding and for educators and professionals interested in exploring this essential area of mathematics.

continuous math vs discrete math: Systemics of Incompleteness and Quasi-Systems Gianfranco Minati, Mario R. Abram, Eliano Pessa, 2019-06-20 This book contains the proceedings of the Seventh National Conference of the Italian Systems Society. The title, Systemics of

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continuous math vs discrete math: *Discrete Mathematics Foundations and Applications* Dr. Mohd Shadab Alam, 2025-02-16 Discrete Mathematics is a systematically structured academic textbook that provides a rigorous exploration of fundamental mathematical concepts essential for various disciplines, particularly computer science and engineering. The book comprehensively covers key topics, including set theory, relations, propositional calculus, functions, Boolean algebra, recurrence relations, graph theory, trees, planar graphs, combinatorial counting principles, algebraic systems, and matrix algebra. The text is designed to facilitate a progressive understanding of discrete mathematical structures, beginning with foundational principles and advancing toward more complex theoretical frameworks. Each chapter presents clearly defined concepts, supplemented with illustrative examples, well-structured exercises, and relevant diagrams to reinforce comprehension and analytical reasoning. A distinguishing feature of this book is its emphasis on the practical applicability of discrete mathematics in computational and algorithmic problem-solving. Topics such as graph theory, Boolean algebra, and recurrence relations play a pivotal role in the design and analysis of algorithms, data structures, and digital logic circuits. Furthermore, the integration of combinatorial techniques and algebraic structures enhances students' ability to model and solve real-world mathematical problems. With its academic rigor and structured pedagogical approach, this book is well-suited for undergraduate students, educators, and researchers seeking a deeper insight into discrete mathematical principles. The accessible yet comprehensive presentation ensures that learners with diverse mathematical backgrounds can engage effectively with the material. Discrete Mathematics serves as a valuable resource for fostering logical reasoning, problem-solving skills, and mathematical abstraction, making it indispensable for academic and professional growth.

continuous math vs discrete math: Rethinking Neural Networks Karl H. Pribram, 2014-04-08 The result of the first Appalachian Conference on neurodynamics, this volume focuses on processing in biological neural networks. How do brain processes become organized during decision making? That is, what are the neural antecedents that determine which course of action is to be pursued? Half of the contributions deal with modelling synapto-dendritic and neural ultrastructural processes; the remainder, with laboratory research findings, often cast in terms of the models. The interchanges at the conference and the ensuing publication also provide a foundation for further meetings. These will address how processes in different brain systems, coactive with the neural residues of experience and with sensory input, determine decisions.

continuous math vs discrete math: <u>Discrete Mathematics in the Schools</u> Joseph G. Rosenstein, 2000 A collection of articles written by experienced primary, secondary, and collegiate educators. It explains why discrete mathematics should be taught in K-12 classrooms and offers guidance on how to do so. It offers school and district curriculum leaders material that addresses how discrete mathematics can be introduced into their curricula.

continuous math vs discrete math: <u>The Influence of Computers and Informatics on Mathematics and Its Teaching</u> R. F. Churchhouse, 1986-01-31 First published in 1986, the first ICMI study is concerned with the influence of computers and computer science on mathematics and its teaching in the last years of school and at tertiary level. In particular, it explores the way the computer has influenced mathematics itself and the way in which mathematicians work, likely influences on the curriculum of high-school and undergraduate students, and the way in which the computer can be used to improve mathematics teaching and learning. The book comprises a report of the meeting held in Strasbourg in March 1985, plus several papers contributed to that meeting.

continuous math vs discrete math: *Introduction to Discrete Mathematics with ISETL* William E. Fenton, Ed Dubinsky, 2012-12-06 Intended for first- or second-year undergraduates, this introduction to discrete mathematics covers the usual topics of such a course, but applies constructivist principles that promote - indeed, require - active participation by the student. Working with the programming language ISETL, whose syntax is close to that of standard mathematical language, the student constructs the concepts in her or his mind as a result of constructing them on the computer in the syntax of ISETL. This dramatically different approach allows students to attempt to discover concepts in a Socratic dialog with the computer. The discussion avoids the formal definition-theorem approach and promotes active involvement by the reader by its questioning style. An instructor using this text can expect a lively class whose students develop a deep conceptual understanding rather than simply manipulative skills. Topics covered in this book include: the propositional calculus, operations on sets, basic counting methods, predicate calculus, relations, graphs, functions, and mathematical induction.

continuous math vs discrete math: Discrete Mathematics with Proof Eric Gossett, 2009-06-22 A Trusted Guide to Discrete Mathematics with Proof?Now in a Newly Revised Edition Discrete mathematics has become increasingly popular in recent years due to its growing applications in the field of computer science. Discrete Mathematics with Proof, Second Edition continues to facilitate an up-to-date understanding of this important topic, exposing readers to a wide range of modern and technological applications. The book begins with an introductory chapter that provides an accessible explanation of discrete mathematics. Subsequent chapters explore additional related topics including counting, finite probability theory, recursion, formal models in computer science, graph theory, trees, the concepts of functions, and relations. Additional features of the Second Edition include: An intense focus on the formal settings of proofs and their techniques, such as constructive proofs, proof by contradiction, and combinatorial proofs New sections on applications of elementary number theory, multidimensional induction, counting tulips, and the binomial distribution Important examples from the field of computer science presented as applications including the Halting problem, Shannon's mathematical model of information, regular expressions, XML, and Normal Forms in relational databases Numerous examples that are not often found in books on discrete mathematics including the deferred acceptance algorithm, the

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continuous math vs discrete math: *Encyclopedia of Giftedness, Creativity, and Talent* Barbara Kerr, 2009-06-17 The three-volume Encyclopedia of Giftedness, Creativity, and Talent presents state-of-the-art research and ready-to-use facts from the fields of education, psychology, sociology, and the arts.

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continuous math vs discrete math: Building a Workforce for the Information Economy National Research Council, Office of Scientific and Engineering Personnel, Board on Science, Technology, and Economic Policy, Board on Testing and Assessment, Computer Science and Telecommunications Board, Committee on Workforce Needs in Information Technology, 2001-03-19 A look at any newspaper's employment section suggests that competition for qualified workers in information technology (IT) is intense. Yet even experts disagree on not only the actual supply versus demand for IT workers but also on whether the nation should take any action on this economically important issue. Building a Workforce for the Information Economy offers an in-depth look at IT. workers-where they work and what they do-and the policy issues they inspire. It also illuminates numerous areas that have been questioned in political debates: Where do people in IT jobs come from, and what kind of education and training matter most for them? Are employers' and workers' experiences similar or different in various parts of the country? How do citizens of other countries factor into the U.S. IT workforce? What do we know about IT career paths, and what does that imply for IT workers as they age? And can we measure what matters? The committee identifies characteristics that differentiate IT work from other categories of high-tech work, including an informative contrast with biotechnology. The book also looks at the capacity of the U.S. educational system and of employer training programs to produce qualified workers.

continuous math vs discrete math: Strict Finitism and the Logic of Mathematical Applications Feng Ye, 2011-07-06 This book intends to show that radical naturalism (or physicalism), nominalism and strict finitism account for the applications of classical mathematics in current scientific theories. The applied mathematical theories developed in the book include the basics of calculus, metric space theory, complex analysis, Lebesgue integration, Hilbert spaces, and semi-Riemann geometry (sufficient for the applications in classical quantum mechanics and general relativity). The fact that so much applied mathematics can be developed within such a weak, strictly finitistic system, is surprising in itself. It also shows that the applications of those classical theories to the finite physical world can be translated into the applications of strict finitism, which demonstrates the applicability of those classical theories without assuming the literal truth of those theories or the reality of infinity. Both professional researchers and students of philosophy of mathematics will benefit greatly from reading this book.

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continuous math vs discrete math: Cybersecurity Systems for Human Cognition Augmentation Robinson E. Pino, Alexander Kott, Michael Shevenell, 2014-10-18 This book explores cybersecurity research and development efforts, including ideas that deal with the growing challenge of how computing engineering can merge with neuroscience. The contributing authors,

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continuous math vs discrete math: *Intelligent Computer Mathematics* Jacques Carette, Lucas Dixon, Claudio Sacerdoti Coen, Stephen Watt, 2009-07-06 As computers and communications technology advance, greater opportunities arise for intelligent mathematical computation. While computer algebra, au- mated deduction and mathematical publishing each have long and successful histories, we are now seeing increasing opportunities for synergy among them. The Conferences on Intelligent Computer Mathematics (cicm 2009) is a c- lection of co-located meetings, allowing researchers and practitioners active in these related areas to share recent results and identify the next challenges. The speci?c areas of the cicm conferences and workshops are described below, but the unifying theme is the computerized handling of mathematical knowledge. The successful formalization of much of mathematics, as well as a better - derstanding of its internal structure, makes mathematical knowledge in many waysmore tractable than generalknowledge,as traditionally treatedin arti?cial intelligence. Similarly, we can also expect the problem of e?ectively using ma- ematical knowledge in automated ways to be much more tractable. This is the goal of the work in the cicm conferences and workshops. In the long view, so- ing the problems addressed by cicm is an important milestone in formulating the next generation of mathematical software.

continuous math vs discrete math: *3D Math Primer for Graphics and Game Development* Fletcher Dunn, Ian Parberry, 2011-11-02 This engaging book presents the essential mathematics needed to describe, simulate, and render a 3D world. Reflecting both academic and in-the-trenches practical experience, the authors teach you how to describe objects and their positions, orientations, and trajectories in 3D using mathematics. The text provides an introduction to mathematics for

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is bounded linear operator necessarily continuous? Bounded linear operators are continuous. (Think about how Lipschitz condition implies uniform continuity for functions on real line). Things in Banach spaces aren't always continuous though

calculus - Relation between differentiable,continuous and The containment "continuous"$\subset$"integrable" depends on the domain of integration: It is true if the domain is closed and bounded (a closed interval), false for open intervals, and for

Continuity and Joint Continuity - Mathematics Stack Exchange So ''continuous'' = ''jointly continuous'' for several variables and otherwise it is called ''continuous in each argument''?

Continuous from the left/right - Mathematics Stack Exchange Continuous from the left/right

Absolutely continuous functions - Mathematics Stack Exchange This might probably be classed as a soft question. But I would be very interested to know the motivation behind the definition of an absolutely continuous function. To state "A real

calculus - Are functions considered continuous at endpoints In either case, a function is continuous on its domain if it is continuous at every point in the domain. Thus a function can be continuous on either $ [a,b]$ or $ (a,b)$

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