Calculus 2 series and sequences pdf

The subject of an infinite series may seem unrelated to calculus and calculus. In fact, an infinite series involving variable powers terms is a powerful tool that we can use to express infinite multi-boundary functions. We can use an infinite series to evaluate complex functions, specific approximate integrations, and create new functions. In addition, an infinite series is used to solve differential equations that design physical behaviour, from small electronic circuits to satellites orbiting the Earth. 9.0: Introduction to sequence and chain snowflake hut has been built from countless unliquefied equilateral triangles. Thus, we can express its space as a set of unlimited terms. How do we add an infinite number of terms? Can the total number of countless terms be limited? To answer these questions, we need to present the concept of an infinite series, an amount with many infinite terms. After selecting the necessary tools, we will be able to calculate the area of snowflake Koch.9.1: SequencesIn this section, provide sequences and determine what it means for a sequence of convergence or spacing. We show how to find the boundaries of sequences that converge, often using the border properties of the functions previously discussed. We close this section with the theory of tone convergence, a tool we can use to prove that certain types of converge.9.2 sequence: Infinite SeriesIn this section define an infinite series and show how the chain relates to sequences. We also determine what it means for the chain to converge or diverge. We present one of the most important types of series: the engineering series. We will use an engineering series in the next chapter to write certain functions as multi-border with an infinite number of terms. This process is important because it allows us to evaluate, distinguish and integrate complex functions using multiple boundaries.9.3: Convergence or difference in several strings is determined by explicitly calculating the partial sum sequence limit. In practice, calculating this limit can be explicitly difficult or impossible. There are several tests that allow us to determine convergence or variation in many types of strings. Here, we discuss two of these tests: spacing testing and integrated testing. We will examine many other tests in the rest of this chapter and then summarize how they are used and when they are used.9.4: Comparative tests we have seen that integrated testing allows us to identify convergence or variation in a series by comparing them with inappropriate and relevant integration. In this section, we show how comparison tests are used to determine convergence or variation in a series by comparing them to a series in which convergence or variation is known. These tests are commonly used to determine the convergence of a series that is similar to an geometric series or p-series.9.5: alternating series in this section we offer a alternating series - those which conditions alternately in signing. We will show in a later chapter that this series often arises when studying the power chain. After rotating series definition, we offer a alternating series test to determine whether this series converges.9.6: the ratio and root tests in this section, we prove the last two series convergence test: ratio test and root test. These tests are nice because they don't require us to find a similar series. Testing a ratio will be particularly useful in discussing the power chain in the next chapter. Throughout this chapter, we have seen that there is no single convergence test that works for all series. Therefore, at the end of this section we discuss the strategy of choosing any convergence test to be used for a particular sys.9.E: sequence and series (exercises) these are homework exercises to accompany OpenStax in the text map calculus. Thumbnail: For the alternating harmonic series, the individual terms \(S_ {2k+1}\) in the sequence of partial totals decrease and are adhered to below. The terms S_{2k}\) are increased and restricted above. Gilbert Strang (MIT) and Edwin Jed Herman (Harvey Maude) with several contributing authors. This content by OpenStax is licensed cc-BY-SA-NC 4.0. Download for free in . Show mobile notice show all notes hide all mobile notice notes showing that you are on a device with tight screen display (i.e. you are probably on the mobile phone). Due to the nature of mathematics on this site it is the best views in landscape mode. If your device is not in horizontal mode, many equations will run on the side of your device (you should be able to scroll to see it) and some menu items will be cut off due to the narrow display display. In this chapter we'll be taking a look at the sequence and the (infinite) series. In fact, this chapter will deal almost exclusively with the series. However, we also need to understand some of the basics of sequencing in order to properly handle the series. So, we'll spend some time on the sequence as well. The series is one of those topics that many students do not find all that useful. To be honest, many students will not see a series outside the calculus class. However, the series does not play an important role in the field of normal differential equations, and without a series of large parts of the field of partial differential equations will not be possible. In other words, the series is an important theme even if you won't see any of the applications. Most applications are outside the scope of most calculus courses and tend to occur in classes that do not take many students. So, as you go through these articles keep in mind that these have apps even if we won't really have many of them covered in this category. Here is a list of topics in this chapter. Sequence - In this section we only determine what we mean by sequence in the math class and give any basic pattern that we will use with them. We will focus on basic terminology, sequencing limits Convergence of sequences in this section. We will also give many basic facts and characteristics that we will need as we work with the sequence. More on sequences - in this section we will continue to examine the sequences. We will determine if the sequence in a sequence is increasing or cascade decreasing and therefore if it is a monotonous sequence. We will also determine that a sequence specified below, bounded and/or bounded by above. Series - Basics - in this section we will officially define the infinite series. We will also provide many basic facts, characteristics and methods that we can use to manipulate a series. We will also briefly discuss how to determine whether an infinite series will converge or diverge (there will be a more in-depth discussion of the subject in the next section). Convergence/Variation in Series - In this section we will discuss in more detail convergence and variation in the infinite series. We'll explain how partial amounts are used to determine whether an infinite string converges or diverges. We will also give a spacing test for the series in this section. Special Series - In this section we will look at three series that either appear regularly or have some beautiful characteristics that we would like to discuss. We will examine the geometric series, the texuping series, and the harmonic series. Integrated Test - In this section we will discuss the use of an integrated test to determine whether an infinite series converges or diverges. Integrated testing can be used on an infinite series provided the series conditions are positive and decreasing. Evidence of integrated testing is also given. Comparison test test/test limit - in this section we will discuss using comparison test and comparison tests to determine whether the infinite series converges or diverges. In order to use any infinite series test conditions must be positive. Proofs are also given to both tests. Alternating test series - in this section we will discuss the use of the alternating test series to determine whether the infinite string converges or diverges. A series test can be used alternately only if the string conditions are alternate in the mark. A series test proof is also given alternately. Absolute Convergence – In this section we will have a brief discussion about the absolute and conditional convergence and how it relates to the convergence of an infinite chain. Ratio Test - In this section we will discuss the use of the ratio test to determine whether an infinite series converges absolutely or diverging. A ratio test can be used on any string, but unfortunately it won't always yield a definitive answer about whether the series will converge at all or spaced out. Evidence of the ratio test is also given. Root Test - In this section we will discuss the use of root test ing to determine whether the infinite chain converges at all or diverges. Root testing can be used on any string, but unfortunately it will not always yield a definitive answer about whether the series will converge perfectly or spaced. Proof of The test is also given. Strategy for the Series - In this section we give a general set of guidelines to determine which test to use in determining whether the infinite series will converge or vary. Also note that there is not a single set of guidelines that will always work, so you always need flexibility in following this set of guidelines. This section also provides a summary of all the different tests, as well as the conditions to be met for use. Grade the value of the series - in this section we will discuss how to use integrated test, comparison test, alternating series test and test ratio, sometimes, to estimate the value of the infinite series. Energy Chain - In this section we will give the definition of the energy chain as well as the definition of the convergence radius and the convergence interval of the power chain. We will also explain how a ratio test and root test can be used to determine the radius and convergence interval of the power chain. Energy Chain and Its Functions - In this section we discuss how a converging geometric chain formula can be used to represent certain functions as an energy chain. To use the geometric chain formula, the function must be able to place it in a certain shape, which is often impossible. However, using this formula quickly demonstrates how functions can be represented as a power chain. We also discuss the differentiation and integration of the power chain. Taylor Series – In this section we will discuss how to find the Taylor/Maclaurin series for a job. This will work for a variety of function much wider than the method discussed in the previous section at the expense of some often unpleasant work. We also derive some of the well-known versions of the Taylor series from \\\bf e}^{x\\\\\\\\\\\\\\\\sin (x)\\\\\\\\\\sin (x)\\\\\\\\\\\\\\x\\\\\\\\\\\\\\\\\\\\sin (x)\\\\\\\\\\\\\\x\\\\\\\\\\\\\\\\\e\\\\\\\\\\\\\\\\\\\\e\\\\\\\\\ Series Apps - In this section we will take a quick look at two applications of the series. We will explain how we can find a series of representations of unspecified hopes that cannot be evaluated in any other way. We'll also see how we can use the first few terms of the power series to round up the function. Binary Series - In this section we will give binary theory and explain how it can be used to quickly expand the terminology in the form \\left (a+b\right)^n}\\\ when \\n\\ is an integer. Additionally, when \(n\) is not an integer attached to a binary theory, it can be used to give representation of the term energy chain. The phrase.