Mathematics **Brunswick School Department**

Pre-Calculus B
Sequences and Series

Essential Understandings	▪ Mathematics can be used to model real-life situations.
Essential Questions	▪ What are sequences and series? ▪ How do you generate the nth term of a sequence? ▪ How do you differentiate between an Arithmetic sequence and a Geometric sequence? ▪ How do you find the sum of a finite or infinite series?
Essential Knowledge	▪ Sequences are generated by an underlying pattern. ▪ The nth term of a sequence is calculated algebraically. ▪ Understand the common difference or common ratio of a sequence. ▪ Understand the formulae needed to sum a series.
Vocabulary	▪ <u>Terms</u>: o arithmetic sequence, geometric sequence, finite, infinite, common ratio, common difference, series, partial sum, limit, summation notation, infinite geometric series, convergent, divergent
Essential Skills	▪ Calculate common differences and common ratios. ▪ Calculate the nth term of a sequence using the appropriate formula. ▪ Determine if a series is convergent or divergent. ▪ Calculate the sum of a finite or infinite series.
Related Maine Learning Results	<u>Mathematics</u> A. Number Real Number A1. Students will know how to represent and use real numbers. a. Use the concept of nth root. b. Estimate the value(s) of roots and use technology to approximate them. c. Compute using laws of exponents. d. Multiply and divide numbers expressed in scientific notation. e. Understand that some quadratic equations do not have real solutions and that there exist other number systems to allow for solutions to these equations.

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Related Maine Learning Results	D. Algebra Functions and Relations D4. Students understand and interpret the characteristics of functions using graphs, tables, and algebraic techniques. a. Recognize the graphs and sketch graphs of the basic functions. b. Apply functions from these families to problem situations. c. Use concepts such as domain, range, zeros, intercepts, and maximum and minimum values. d. Use the concepts of average rate of change (table of values) and increasing and decreasing over intervals, and use these characteristics to compare functions. D5. Students express relationships recursively and use iterative methods to solve problems. a. Express the (n+1)st term in terms of the nth term and describe relationships in terms of starting point and rule followed to transform one terms to the next. b. Use technology to perform repeated calculations to develop solutions to real life problems involving linear, exponential, and other patterns of change.
Sample Lessons And Activities	▪ Find the first five terms of a sequence. ▪ Find the nth term of a sequence. ▪ Write a series using a summation notation. ▪ Expand and evaluate a series.
Sample Classroom Assessment Methods	▪ Evaluate homework. ▪ Quizzes. ▪ Chapter test.
Sample Resources	▪ Publications: o Glencoe Advanced Mathematical Concepts ▪ Other: o Graphing calculators. o The A+ learning system for remediation.