SOMERSET COUNTY VOCATIONAL & TECHNICAL SCHOOLS
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Pre-Calculus

Topic/ Pacing	Unit 1. Functions and their Graphs Topics: ● Rectangular Coordinates ● Graphs of Equations ● Linear Equations in Two Variables ● Functions ● Analyzing Graphs of Functions ● A Library of Parent Functions ● Transformation of Functions ● Combinations of Functions: Composite Functions ● Inverse Functions ● Mathematical Modeling and Variation Pacing: About 1 month	Unit 2. Polynomials and Rational Functions Topics: Quadratic Functions and Models Polynomial Functions of Higher Degree Polynomial and Synthetic Division Complex Numbers Zeros of Polynomial Functions Rational Functions Nonlinear Inequalities Pacing: About 2.5 months	Unit 3. Exponential and Logarithmic Functions Topics: Exponential Functions and their Graphs Logarithmic Functions and their Graphs Properties of Logarithms Exponential and Logarithmic Equations Exponential and Logarithmic Models Pacing: About 2.5 months	Unit 4. Trigonometry Topics: Radian and Degree Measure Trigonometric Functions: The Unit Circle Right Triangle Trigonometry Trigonometric Functions of Any Angle Graphs of SIne and Cosine Functions Graphs of Other Trigonometric Functions Inverse Trigonometric Functions Applications and Models Pacing: About 3 months
NJSLS	● 8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	● HS.N-CN.C. Use complex numbers in polynomial identities and equations. ● HS.A-APR.B. Understand the relationship between zeros and factors of polynomials	● HS.F-IF.C. Analyze functions using different representations ● HS.F-LE.A. Construct and compare linear and exponential models and solve problem	● HS.F.TF.A. Extend the domain of trigonometric functions using the unit circle ● HS.F-TF.B. Model periodic phenomena with trigonometric functions

	● HS.F-BF.A. Build a function that models a relationship between two quantities ● HS.F-BF.B. Build new functions from existing functions	● HS.A-APR.D. Rewrite rational expressions ● HS.A.REI.D. Represent and solve equations and inequalities graphically ● HS.F-IF.B. Interpret functions that arise in applications in terms of the context	● HS.F-LE.B. Interpret expressions for functions in terms of the situation they model	● HS.F-TF.C. Prove and apply trigonometric identities
Technology Connections	8.1.12DA1-6 8.1.12AP1-2	8.1.12DA1-6 8.1.12AP1-2	8.1.12DA1-6 8.1.12AP1-2	8.1.12DA1-6 8.1.12AP1-2
21st Century Knowledge & Skills	9.4.12CI1-3 9.4.12IML3-4 9.4.12TL1-4	9.4.12CI1-3 9.4.12IML3-4 9.4.12TL1-4	9.4.12CI1-3 9.4.12IML3-4 9.4.12TL1-4	9.4.12CI1-3 9.4.12IML3-4 9.4.12TL1-4
Skills (SWBAT)	● Use Distance Formula to find the distance between two points and use the Midpoint Formula to find the midpoint of a line segment. ● Use x- and y-intercepts, their symmetry and slope to sketch graphs of equations. ● Learn how to identify the 8 most commonly used functions in algebra: constant, identity, absolute value, quadratic, cubic, square root,	● Identify key characteristics in graphing quadratic and other polynomial functions. ● Perform operations with complex numbers. ● Find zeros of polynomial functions. ● Learn to use polynomial division to find both real and complex roots. ● Learn to find asymptotes, intercepts, and holes as they graph rational functions.	● Write, graph, and recognize the basic characteristics of exponential and logarithmic functions. ● Learn how to use these functions to model real-world problems including compound interest, radioactive decay, and human memory. ● Expand their skills by using the properties of logarithms and exponents to manipulate expressions and solve equations.	● Learn about angles and the use of radian and degree measures. ● Identify a unit circle and describe its relationship to real numbers. ● Evaluate trigonometric functions using the unit circle. ● Evaluate trigonometric functions of acute angles. ● Evaluate trigonometric functions of any angles and of real numbers. ● Sketch the graphs of the basic trigonometric

	reciprocal, and greatest integer functions. ● Find the zeros of functions. ● Determine intervals on which functions are increasing or decreasing and determine relative maximum and relative minimum values of functions. ● Determine the average rate of change of a function. ● Use transformations to graph functions. ● Use functions and their graphs to model and solve real-life problems.	● Use quadratic functions to model and solve real-life problems. ● Solve polynomial and rational inequalities. ● Use inequalities to model and solve real-life problems.	● Use exponential growth and decay functions to model and solve real-life problems. ● Use logarithmic functions to model and solve real-life problems.	functions and their reciprocals. ● Evaluate the compositions of trigonometric functions. ● Solve real-life problems using right triangles.
Assessments/Benchmarks	● Do Nows ● Exit Tickets ● Homework ● Section Quizzes ● Chapter Tests ● Mid-year and Year-end benchmark assessments	Do Nows Exit Tickets Homework Section Quizzes Chapter Tests Mid-year and Year-end benchmark assessments	Do Nows Exit Tickets Homework Section Quizzes Chapter Tests Mid-year and Year-end benchmark assessments	Do Nows Exit Tickets Homework Section Quizzes Chapter Tests Mid-year and Year-end benchmark assessments
Resources	● Precalculus with Limits (Textbook by Larson) ● Precalculus : Mathematics for Calculus (Textbook by Stewart) ● Kuta Worksheets (Web)	Precalculus with Limits (Textbook by Larson) Precalculus : Mathematics for Calculus (Textbook by Stewart) ● Kuta Worksheets (Web)	Precalculus with Limits (Textbook by Larson) Precalculus : Mathematics for Calculus (Textbook by Stewart) Kuta Worksheets (Web)	Precalculus with Limits (Textbook by Larson) Precalculus : Mathematics for Calculus (Textbook by Stewart) Kuta Worksheets (Web)
Accommodations	● Frequently check for understanding ● Extended time on tests/quizzes/projects as needed	Frequently check for understanding Extended time on tests/quizzes/projects as needed	Frequently check for understanding Extended time on tests/quizzes/projects as needed	Frequently check for understanding Extended time on tests/quizzes/projects as needed

	● Encourage students to ask for assistance when needed ● Use physical proximity to increase student's attention to instruction ● Repeat or rephrase directions and/or clarify and reword directions ● Accompany oral directions with written directions ● Provide a calculator for math computation ● Break down tasks into smaller, more manageable chunks with frequent teacher checks ● Provide verbal praise and positive reinforcement ● Allow the student to use an alternate method of production ● Provide multi-sensory instruction ● Provide a word bank	● Encourage students to ask for assistance when needed ● Use physical proximity to increase student's attention to instruction ● Repeat or rephrase directions and/or clarify and reword directions ● Accompany oral directions with written directions ● Provide a calculator for math computation ● Break down tasks into smaller, more manageable chunks with frequent teacher checks ● Provide verbal praise and positive reinforcement ● Allow the student to use an alternate method of production ● Provide multi-sensory instruction ● Provide a word bank	● Encourage students to ask for assistance when needed ● Use physical proximity to increase student's attention to instruction ● Repeat or rephrase directions and/or clarify and reword directions ● Accompany oral directions with written directions ● Provide a calculator for math computation ● Break down tasks into smaller, more manageable chunks with frequent teacher checks ● Provide verbal praise and positive reinforcement ● Allow the student to use an alternate method of production ● Provide multi-sensory instruction ● Provide a word bank	● Encourage students to ask for assistance when needed ● Use physical proximity to increase student's attention to instruction ● Repeat or rephrase directions and/or clarify and reword directions ● Accompany oral directions with written directions ● Provide a calculator for math computation ● Break down tasks into smaller, more manageable chunks with frequent teacher checks ● Provide verbal praise and positive reinforcement ● Allow the student to use an alternate method of production ● Provide multi-sensory instruction ● Provide a word bank
Enrichment	● Khan Academy: A fantastic free resource that offers explanations, videos, and practice problems. https://www.khanacademy.org/math/precalculus	● Khan Academy: A fantastic free resource that offers explanations, videos, and practice problems. https://www.khanacademy.org/math/precalculus	● Khan Academy: A fantastic free resource that offers explanations, videos, and practice problems. https://www.khanacademy.org/math/precalculus	● Khan Academy: A fantastic free resource that offers explanations, videos, and practice problems. https://www.khanacademy.org/math/precalculus

	● Mr. Ryman's Website: Mr. Ryman is a math teacher in Florida and he has an excellent website with lessons, practice problems, and even videos. http://mrryman.weebly.com/precalc-extra-help.html ● The Math Page: Free resource with small lessons and practice problems. http://www.themathpage.com/aprecalc/precalculus.htm ● Cool Math Page: Free resource with review and sample problems. http://www.coolmath.com/precalculus-review-calculus-intro	● Mr. Ryman's Website: Mr. Ryman is a math teacher in Florida and he has an excellent website with lessons, practice problems, and even videos. http://mrryman.weebly.com/precalc-extra-help.html ● The Math Page: Free resource with small lessons and practice problems. http://www.themathpage.com/aprecalc/precalculus.htm ● Cool Math Page: Free resource with review and sample problems. http://www.coolmath.com/precalculus-review-calculus-intro	● Mr. Ryman's Website: Mr. Ryman is a math teacher in Florida and he has an excellent website with lessons, practice problems, and even videos. http://mrryman.weebly.com/precalc-extra-help.html ● The Math Page: Free resource with small lessons and practice problems. http://www.themathpage.com/aprecalc/precalculus.htm ● Cool Math Page: Free resource with review and sample problems. http://www.coolmath.com/precalculus-review-calculus-intro	● Mr. Ryman's Website: Mr. Ryman is a math teacher in Florida and he has an excellent website with lessons, practice problems, and even videos. http://mrryman.weebly.com/precalc-extra-help.html ● The Math Page: Free resource with small lessons and practice problems. http://www.themathpage.com/aprecalc/precalculus.htm ● Cool Math Page: Free resource with review and sample problems. http://www.coolmath.com/precalculus-review-calculus-intro