AM = Advanced Math
A2 = Algebra II
G = Geometry
I = Integrated Math
TCM = Transition to College Math

Groveport Madison Local School District
Eleventh Grade Math Content Standards
Planning Sheets

Standard: Data Analysis & Probability	**1st 9 wks**	**2nd 9 wks**	**3rd 9wks**	**4th 9 wks**
A. Create and analyze tabular and graphical displays of data using appropriate tools, including spreadsheet and graphing calculators.				
4. Create a scatter plot of bivariate data, identify trends, and find a function to model the data.				A2
5. Use technology to find the Least Squares Regression Line, the regression coefficient, and the correlation coefficient for bivariate data with a linear trend, and interpret each of these statistics in the context of the problem situation.				A2
7. Describe the standard normal curve and its general properties, and answer questions dealing with data assumed to be normal.				A2
8. Analyze and interpret univariate and bivariate data to identify patterns, note trends, draw conclusions, and make predictions.				A2
10. Understand and use the concept of random variable, and compute and interpret the expected value for a random variable in simple cases.				A2
B. Use descriptive statistics to analyze and summarize data, including measures of center, dispersion, correlation and variability.				
3. Describe how a linear transformation of univariate data affects range, mean, mode and median.				
5. Use technology to find the Least Squares Regression Line, the regression coefficient, and the correlation coefficient for bivariate data with a linear trend, and interpret each of these statistics in the context of the problem situation.				A2
6. Use technology to compute the standard deviation for a set of data, and interpret standard deviation in relation to the context or problem situation.				A2
8. Analyze and interpret univariate and bivariate data to identify patterns, note trends, draw conclusions, and make predictions.				A2

Groveport Madison Local School District

Tenth Grade Math Content Standards

Planning Sheets

Standard: Data Analysis & Probability	**1st 9 wks**	**2nd 9 wks**	**3rd 9wks**	**4th 9 wks**
C. Design and perform a statistical experiment, simulation or study; collect and interpret data; and use descriptive statistics to communicate and support predictions and conclusions.				
1. Design a statistical experiment, survey or study for a problem; collect data for the problem; and interpret the data with appropriate graphical displays, descriptive statistics, and concepts of variability, causation, correlation and standard deviation.				
2. Describe the role of randomization in a well-designed study, especially as compared to a convenience sample, and the generalization of results from each.				
9. Evaluate validity of results of a study based on characteristics of the study design, including sampling method, summary statistics and data analysis techniques.				
D. Connect statistical techniques to applications in workplace and consumer situations.				
1. Design a statistical experiment, survey or study for a problem; collect data for the problem; and interpret the data with appropriate graphical displays, descriptive statistics, concepts of variability, causation, correlation and standard deviation.				
2. Describe the role of randomization in a well-designed study, especially as compared to a convenience sample, and the generalization of results from each.				
9. Evaluate validity of results of a study based on characteristics of the study design, including sampling method, summary statistics and data analysis techniques.				
11. Examine statements and decisions involving risk; e.g., insurance rates and medical decisions.				

AM = Advanced Math
A2 = Algebra II
G = Geometry
I = Integrated Math
TCM = Transition to College Math

Groveport Madison Local School District
Eleventh Grade Math Content Standards
Planning Sheets

Standard: Geometry and Spatial Sense	**1st 9 wks**	**2nd 9 wks**	**3rd 9wks**	**4th 9 wks**
A. Use trigonometric relationships to verify determine solutions in problem situations.				
4. Use trigonometric relationships to determine lengths and angle measures; i.e., Law of Sines and Law of Cosines.				AM, TCM
B. Represent transformations within a coordinate system using vectors and matrices.				
1. Use polar coordinates to specify locations on a plane.				
2. Represent translations using vectors.				AM
3. Describe multiplication of a vector and a scalar graphically and algebraically, and apply to problem situations.				AM
A. Formally define geometric figures.				
D. Use coordinate geometry to represent and examine the properties of geometric figures.				
E. Draw and construct representations of two- and three-dimensional geometric objects using a variety of tools, such as straightedge, compass and technology.				
5. Identify, sketch and classify the cross sections of three-dimensional objects.				AM
H. Use formal mathematical language and notation to represent ideas, to demonstrate relationships within and among representation systems, and to formulate generalizations.				

AM = Advanced Math
A2 = Algebra II
G = Geometry
I = Integrated Math
TCM = Transition to College Math

Groveport Madison Local School District
Eleventh Grade Math Content Standards
Planning Sheets

Standard: Measurement Standard	**1st 9 wks**	**2nd 9 wks**	**3rd 9wks**	**4th 9 wks**
A. Explain differences among accuracy, precision and error, and describe how each of those can affect solutions in measurement situations.				
1. Explain how a small error in measurement may lead to a large error in calculated results.				G
2. Calculate relative error.				G
3. Explain the difference between absolute error and relative error in measurement.				G
4. Give examples of how the same absolute error can be problematic in one situation but not in another; e.g., compare “accurate to the nearest foot” when measuring the height of a person versus when measuring the height of a mountain.				G
1. Determine the number of significant digits in a measurement.	A2			I
B. Apply various measurement scales to describe phenomena and solve problems.				
2. Use radian and degree angle measures to solve problems and perform conversions as needed.			AM	
C. Estimate and compute areas and volume in increasingly complex problem situations.				
3. Derive a formula for the surface area of a cone as a function of its slant height and the circumference of its base.				G
4. Calculate distances, areas, surface areas and volumes of composite three-dimensional objects to a specified number of significant digits.			G	
D. Solve problem situations involving derived measurements; e.g., density, acceleration.				
5. Solve real-world problems involving area, surface area, volume and density to a specified degree of precision.			G	

AM = Advanced Math
A2 = Algebra II
G = Geometry
I = Integrated Math
TCM = Transition to College Math

Groveport Madison Local School District
Eleventh Grade Math Content Standards
Planning Sheets

Standard: Number, Number Sense and Operations	1st 9 wks	2nd 9 wks	3rd 9wks	4th 9 wks
A. Demonstrate that vectors and matrices are systems having some of the same properties of the real number system.				
1. Determine what properties hold for matrix addition and matrix multiplication; e.g., use examples to show addition is commutative and when multiplication is not commutative.		A2		
2. Determine what properties hold for vector addition and multiplication, and for scalar multiplication.				AM
B. Develop an understanding of properties of and representations for addition and multiplication of vectors and matrices.				
1. Determine what properties hold for matrix addition and matrix multiplication; e.g., use examples to show addition is commutative and when multiplication is not commutative.		A2		
2. Determine what properties hold for vector addition and multiplication, and for scalar multiplication.				AM
5. Model using the coordinate plane, vector addition and scalar multiplication.				AM
C. Apply factorials and exponents, including fractional exponents, to solve practical problems.				
3. Use factorial notation and computations to represent and solve problem situations involving arrangements.				
D. Demonstrate fluency in operations with real numbers, vectors and matrices, using mental computation or paper and pencil calculations for simple cases, and technology for more complicated cases.				
4. Use matrices to represent given information in a problem situation.		A2		
6. Compute sums, differences and products of matrices using paper and pencil calculations for simple cases, and technology for more complicated cases.		A2		
9. Use vector addition and scalar multiplication to solve problems.				AM
E. Represent and compute with complex numbers.				
3. Represent complex numbers on the complex plane.			A2/TCM	
7. Compute sums, differences, products and quotients of complex numbers.	AM		A2/TCM	

AM = Advanced Math
A2 = Algebra II
G = Geometry
I = Integrated Math
TCM = Transition to College Math

Groveport Madison Local School District
Eleventh Grade Math Content Standards
Planning Sheets

Standard: Patterns, Functions and Algebra	1st 9 wks	2nd 9 wks	3rd 9wks	4th 9 wks
A. Analyze functions by investigating rates of change, intercepts, zeros, asymptotes, and local and global behavior.				
3. Describe and compare the characteristics of the following families of functions; quadratics with complex roots, polynomials of any degree, logarithms, and rational functions; e.g., general shape, number of roots, domain and range, asymptotic behavior.		AM		A2
4. Identify the maximum and minimum points of polynomial, rational and trigonometric functions graphically and with technology.				AM
5. Identify families of functions with graphs that have rotation symmetry or reflection symmetry about the y-axis, x-axis or y = x.		TCM		
6. Represent the inverse of a function symbolically and graphically as a reflection about y = x.		AM		
10. Describe the characteristics of the graphs of conic sections.				AM
11. Describe how a change in the value of a constant in an exponential, logarithmic or radical equation affects the graph of the equation.		AM, TCM		A2
B. Use the quadratic formula to solve quadratic equations that have complex roots.				
8. Solve equations involving radical expressions and complex roots.		AM	TCM	A2
C. Use recursive functions to model and solve problems; e.g. home mortgages, annuities.				
1. Identify and describe problem situations involving an iterative process that can be represented as a recursive function; e.g., compound interest.				AM
2. Translate a recursive function into a closed form expression or formula for the nth term to solve a problem situation involving an iterative process; e.g., find the value of an annuity after 7 years.	AM			
D. Apply algebraic methods to represent and generalize problem situations involving vectors and matrices.				
7. Model and solve problems with matrices and vectors.				AM
9. Solve 3 by 3 systems of linear equations by elimination and using technology, and interpret graphically what the solution means (a point, line, plane, or not solution).				AM, A2