

Semester 1		Semester 2	
<p>Unit #1 – The Building Blocks of Algebra</p> <ul style="list-style-type: none"> ➤ Rates, Patterns and Problem Solving ➤ Variables and Expressions ➤ The Commutative and Associative Properties ➤ The Distributive Property ➤ Equivalent Expressions ➤ Seeing Structure in Expressions ➤ Exponents as Repeated Multiplication ➤ More Complex Equivalency ➤ Translating English to Algebra <p>Unit #2 – Linear Expressions, Equations and Inequalities</p> <ul style="list-style-type: none"> ➤ Equations and Their Solutions ➤ Seeing Structure to Solve Equations ➤ A Linear Equation Solving Review ➤ Justifying Steps in Solving an Equation ➤ Linear Word Problems ➤ Linear Equations and Consecutive Integers ➤ Solving Linear Equations with Unspecified Constants ➤ Inequalities ➤ Solving Linear Inequalities ➤ Interval Notation ➤ Modeling with Inequalities 	<p>Unit #3-Functions</p> <ul style="list-style-type: none"> ➤ Introduction to Functions ➤ Function Notation ➤ Graphs of Functions ➤ Graphical Features ➤ Exploring Functions Using the Graphing Calculator ➤ Average Rate of Change ➤ The Domain and Range of a Function <p>Unit #4 – Linear Functions</p> <ul style="list-style-type: none"> ➤ Proportional Relationships ➤ Unit Conversions ➤ Non-proportional Linear Relationships ➤ Graphing Linear Functions (Lines) ➤ Writing Equations in Slope-Intercept Form ➤ Finding slope from a graph ➤ Finding slope from two points ➤ Finding equation of slope ➤ Graphing lines using slope intercept ➤ Graphing lines using standard form ➤ Writing linear Equations 	<p>Unit #5 – Systems of Linear Equations and Inequalities</p> <ul style="list-style-type: none"> ➤ Solutions to Systems and Solving by Graphing ➤ Solving Systems by Substitution ➤ Properties of Systems and Their Solutions ➤ The Elimination Method ➤ Modeling with Systems of Equations ➤ Solving Equations Graphically ➤ Solving Systems of Inequalities ➤ Modeling with Systems of Inequalities <p>Unit #6 – Exponents</p> <ul style="list-style-type: none"> ➤ Simplifying Exponents ➤ Zero and Negative Exponents ➤ Exponential Growth ➤ Intro to Exponential Functions Percent Review ➤ Percent Increase and Decrease 	<p>Unit #7- Polynomials</p> <ul style="list-style-type: none"> ➤ Intro to Polynomials ➤ Multiplying Polynomials ➤ Factoring Polynomials ➤ Factoring Based on Conjugate Pairs ➤ Factoring Trinomials <p>Unit #8 - Square Roots</p> <ul style="list-style-type: none"> ➤ Simplifying Square roots <p>Unit #9-Statistics</p> <ul style="list-style-type: none"> ➤ Graphical Displays of Data ➤ Quartiles and Boxplots ➤ Measures of Central Tendency

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<p>Unit #1 - The Building Blocks of Algebra Review all lessons with Supplemental Worksheets</p> <ul style="list-style-type: none"> ➤ Rates, Patterns and Problem Solving ➤ Variables and Expressions ➤ The Commutative and Associative Properties ➤ The Distributive Property ➤ Equivalent Expressions ➤ Seeing Structure in Expressions ➤ Exponents as Repeated Multiplication ➤ More Complex Equivalency ➤ Structure Work ➤ Translating English to Algebra ➤ Algebraic Puzzles <p>Unit #2 - Linear Expressions, Equations and Inequalities Review all lessons with Supplemental Worksheets</p> <ul style="list-style-type: none"> ➤ Equations and Their Solutions ➤ Seeing Structure to Solve Equations 	<p>Unit #4 - Linear Functions and Arithmetic Sequences Review Lessons 1-5 with Supplemental Worksheets</p> <ul style="list-style-type: none"> ➤ Proportional Relationships ➤ Unit Conversions ➤ Non-proportional Linear Relationships ➤ Graphing Linear Functions (Lines) ➤ Writing Equations in Slope-Intercept Form <p>Unit 4 Lessons 6-13</p> <ul style="list-style-type: none"> ➤ Modeling with Linear Functions ➤ Linear Modeling ➤ Strange Lines- Vertical and Horizontal ➤ Absolute Value and Step Functions ➤ The Truth about Graphs ➤ Graphs of Linear Inequalities ➤ Introduction to Sequences ➤ Arithmetic Sequences 	<p>Unit #6 - Exponents Review Lessons 1-6 with Supplemental Worksheets</p> <ul style="list-style-type: none"> ➤ Simplifying Expressions Involving Exponents ➤ Zero and Negative Exponents ➤ Exponential Growth ➤ Intro to Exponential Functions ➤ Percent Review ➤ Percent Increase and Decrease <p>Lessons 7-9</p> <ul style="list-style-type: none"> ➤ Exponential Models Based on Percent Growth ➤ Linear versus Exponential ➤ Geometric Sequences Unit <p>Unit #7- Polynomials Review Lessons 1-4 with Supplemental Worksheets</p> <ul style="list-style-type: none"> ➤ Intro to Polynomials ➤ Multiplying Polynomials ➤ Factoring Polynomials ➤ Factoring Based on Structure 	<p>Unit #9- Roots and Irrational Numbers</p> <ul style="list-style-type: none"> ➤ Square Roots ➤ Irrational Numbers ➤ Square Root Functions and Shifting ➤ Solving Quadratics Using Inverse Operations ➤ Finding Zeroes by Completing the Square ➤ The Quadratic Formula ➤ Cube Roots <p>Unit #10- Exponents</p> <ul style="list-style-type: none"> ➤ Graphical Displays of Data ➤ Quartiles and Box Plots ➤ Measures of Central Tendency ➤ Variation within a Data Set ➤ Two Way Frequency Tables ➤ Bivariate Data Analysis ➤ Linear Regression on the Calculator ➤ Other Types of Regression ➤ Quantifying Predictability ➤ Residuals

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<ul style="list-style-type: none"> ➤ A Linear Equation Solving Review ➤ Justifying Steps in Solving an Equation ➤ Linear Word Problems ➤ Linear Equations and Consecutive Integer Games. ➤ Solving Linear Equations with Unspecified Constants ➤ Inequalities ➤ Solving Linear Inequalities ➤ Compound Inequalities ➤ Interval Notation ➤ Modeling with Inequalities <p>Unit #3-Functions</p> <ul style="list-style-type: none"> ➤ Introduction to Functions ➤ Function Notation ➤ Graphs of Functions ➤ Graphical Features ➤ Exploring Functions Using the Graphing Calculator ➤ Average Rate of Change ➤ The Domain and Range of a Function <p>Quarterly Review Quarterly Test</p>	<p>Unit #5 – Systems of Linear Equations and Inequalities</p> <ul style="list-style-type: none"> ➤ Solutions to Systems and Solving by Graphing ➤ Solving Systems by Substitution ➤ Properties of Systems and Their Solutions ➤ The Elimination Method ➤ Modeling with Systems of Equations ➤ Solving Equations Graphically ➤ Solving Systems of Inequalities ➤ Modeling with Systems of Inequalities <p>Quarterly Review Quarterly Test</p>	<p>Lessons 5 and 6</p> <ul style="list-style-type: none"> ➤ Factoring Trinomials ➤ More Factoring <p>Unit #8- Quadratic Functions and Their Algebra</p> <ul style="list-style-type: none"> ➤ Intro to Quadratic Functions ➤ More Work with Parabolas ➤ The Shifted Form of Parabolas ➤ Completing the Square ➤ Stretching the Parabola and more Completing the Square ➤ The Zeroes of Quadratics ➤ Zero Product Law <p>Quarterly Review Quarterly Test</p>	<p>Unit #11– Functions and Modeling</p> <ul style="list-style-type: none"> ➤ Function Transformations ➤ Horizontal Stretching of Functions ➤ Discrete Functions ➤ Linear and Exponential Models ➤ Step Functions Revisited ➤ Piecewise Linear Functions ➤ Quadratic Models ➤ Limits on the Accuracy of our Models <p>Regents review</p> <p><i>*Note Units are not sequential as they are based on the Algebra I curriculum some are taught in 9S and the remaining are taught in 10S</i></p>

Algebra I Curriculum Map
Prerequisite: None

Grade: 9
Full Year Course

Semester 1	Semester 2
<p>Unit 1 – Equations and Inequalities</p> <ul style="list-style-type: none">➤ Equations and their properties➤ Solving linear Equations➤ Re-arranging formulas➤ Linear equation word problems➤ Solution sets and properties of inequalities➤ Solving linear inequalities➤ Interval Notation <p>Unit 2 – Functions</p> <ul style="list-style-type: none">➤ Function notation➤ Graphing functions (Linear, Quadratic and Absolute Value)➤ Domain and range of functions➤ Graphing piecewise functions➤ Average rate of change <p>Unit 3 – Linear Functions</p> <ul style="list-style-type: none">➤ Graphing linear functions➤ Properties of linear functions➤ Slope➤ x and y intercepts➤ Writing equations of linear functions➤ Modeling with linear functions➤ Arithmetic sequences➤ Fitting linear functions to data <p>Unit 4 – Exponential Functions</p> <ul style="list-style-type: none">➤ Properties of exponents➤ Exponential growth and decay➤ Geometric sequences➤ Graphs of exponential functions➤ Modeling with exponential functions➤ Comparing linear and exponential functions <p>Unit 5 – Systems of Linear Equations</p> <ul style="list-style-type: none">➤ Solving systems of equations graphically➤ Solving systems of equations with substitution➤ Solving systems of equations with elimination➤ Graphing linear inequalities➤ Systems of linear inequalities➤ Modeling with linear systems of equations and inequalities	<p>Unit 6 – Polynomials</p> <ul style="list-style-type: none">➤ Adding and subtracting polynomials➤ Multiplying polynomials➤ Factoring polynomials<ul style="list-style-type: none">• Greatest common factor• Trinomials $a = 1$• Difference of perfect squares➤ Factoring completely➤ Seeing structure in polynomials <p>Unit 7 – Quadratic Equations</p> <ul style="list-style-type: none">➤ The zero-product property➤ Solving quadratic equations by factoring➤ Quadratic linear systems (algebraically and graphically)➤ Properties of rational and irrational numbers➤ Operations with square roots➤ Solving quadratics by completing the square➤ Solving quadratics using the quadratic formula➤ Applications of quadratic equations <p>Unit 8 – Quadratic Functions</p> <ul style="list-style-type: none">➤ Properties of the graphs of quadratic functions<ul style="list-style-type: none">• Vertex• Axis of symmetry• x and y intercepts• Increasing and decreasing intervals➤ Zeros and factors of quadratic functions➤ Comparing quadratic functions➤ Solving equations graphically➤ Translating graphs of functions➤ Vertically stretching graphs of functions➤ Quadratic functions in vertex form <p>Unit 9 – Descriptive Statistics</p> <ul style="list-style-type: none">➤ Displaying data➤ Measures of the center of a set of data➤ Box plots➤ Measures of the spread of a set of data➤ Categorical data➤ Correlation coefficient <p>Regents Review</p>

Updated Review July 2024

Geometry R (Advanced) Curriculum Map
Prerequisite: Algebra I

Grade: 10
Full Year Course

Semester 1		Semester 2	
<p>Unit 1 – Geometric Terminology</p> <ul style="list-style-type: none"> ➤ Construct an Equilateral Triangle ➤ Copy and Bisect an Angle ➤ Construct a Perpendicular Bisector ➤ Circumcenter and Incenter ➤ Angles and Lines at a Point ➤ Transversals and Parallel Lines ➤ Auxiliary Lines ➤ Angles in a Triangle ➤ Finding Unknown Angles ➤ Mid-Segment of a Triangle ➤ Centroid and Orthocenter <p>Unit 2 – Rigid Motions</p> <ul style="list-style-type: none"> ➤ Reflections in the Coordinate Plane ➤ Constructions of Reflections ➤ Translations in the Coordinate Plane ➤ Constructions of Translations ➤ Rotations in the Coordinate Plane ➤ Rotations off the Coordinate Plane ➤ Types of Symmetry ➤ Composition of Rigid Motions ➤ Congruence in Terms of Rigid Motions <p>Unit 3 – Triangle Congruence</p> <ul style="list-style-type: none"> ➤ Introduction to Proof and SSS Triangle Congruence ➤ SAS Triangle Congruence ➤ ASA Triangle Congruence ➤ AAS Triangle Congruence and CPCTC ➤ HL Triangle Congruence ➤ Proofs Involving Isosceles Triangles ➤ Proofs of Parallel Lines ➤ Advanced Triangle Congruence Proofs 	<p>Unit 4 – Parallelograms</p> <ul style="list-style-type: none"> ➤ Properties of Parallelograms ➤ Proving a Quadrilateral is a Parallelogram ➤ Proofs with Parallelograms ➤ Proofs with Trapezoids ➤ Constructions with Parallelograms ➤ Mid-Segment Theorem <p>Unit 5 – Similarity</p> <ul style="list-style-type: none"> ➤ Scale Drawings and Similarity ➤ Scale Drawings Using the Ratio Method ➤ Dilations on the Coordinate Plane ➤ Dilations Mapping Segments, Lines, Rays and Circles ➤ Dilations Mapping Angles ➤ Similarity Transformations ➤ Similarity Criteria for Triangles - AA ➤ Similarity Criteria for Triangles - SAS and SSS 	<p>Unit 6 – Right Triangles and Introduction to Trigonometry</p> <ul style="list-style-type: none"> ➤ Simplifying, Multiplying, & Dividing Radicals ➤ Adding & Subtracting Radicals ➤ The Pythagorean Theorem ➤ Trigonometric Ratios Sine, Cosine and Tangent ➤ Sine and Cosine of Complementary Angles ➤ Trigonometric Ratios to Find Missing Sides ➤ Trigonometric Ratios to Find Missing Angles ➤ Angle of Elevation/Depression ➤ Law of Sines ➤ Special Right Triangles ➤ Trigonometry & The Pythagorean theorem <p>Unit 7 – Three Dimensional Figures</p> <ul style="list-style-type: none"> ➤ Perimeter and Area ➤ Circumference and Area of a Circle ➤ Arc Length and Area of Sectors ➤ General Prisms & Cylinders and their Cross-Sections ➤ General Cones & Pyramids and their Cross-Sections ➤ Finding Volumes ➤ Volume of Composite Figures ➤ Density 	<p>Unit 8 – Coordinate Geometry</p> <ul style="list-style-type: none"> ➤ Equation of a line point-slope form ➤ Parallel and Perpendicular Lines ➤ Dividing Segments Proportionally ➤ Equations of the Perpendicular Bisector ➤ The Distance Formula ➤ Coordinate Proofs Triangles ➤ Coordinate Proofs Quadrilaterals <p>Unit 9 – Circles</p> <ul style="list-style-type: none"> ➤ Equation of a Circle, Center-Radius Form ➤ Equation of a Circle, Standard Form ➤ Circle Terminology ➤ Inscribed Angles ➤ Intersecting Chords ➤ Secants and Tangents (Angles) ➤ Secants and Tangents (Segments) ➤ Circle Proofs <p>Regents Review</p> <p>*This advanced section of this course will cover these topics along with additional topics that vary year to year based on student ability. These additional topics will provide the advanced students a deeper understanding of the units covered in this course.</p>

Updated Review July 2024

Semester 1		Semester 2	
<p>Unit 1 – Geometric Terminology</p> <ul style="list-style-type: none"> ➤ Construct an Equilateral Triangle ➤ Copy and Bisect an Angle ➤ Construct a Perpendicular Bisector ➤ Circumcenter and Incenter ➤ Angles and Lines at a Point ➤ Transversals and Parallel Lines ➤ Auxiliary Lines ➤ Angles in a Triangle ➤ Finding Unknown Angles ➤ Mid-Segment of a Triangle ➤ Centroid and Orthocenter <p>Unit 2 – Rigid Motions</p> <ul style="list-style-type: none"> ➤ Reflections in the Coordinate Plane ➤ Constructions of Reflections ➤ Translations in the Coordinate Plane ➤ Constructions of Translations ➤ Rotations in the Coordinate Plane ➤ Rotations off the Coordinate Plane ➤ Types of Symmetry ➤ Composition of Rigid Motions ➤ Congruence in Terms of Rigid Motions <p>Unit 3 – Triangle Congruence</p> <ul style="list-style-type: none"> ➤ Introduction to Proof and SSS Triangle Congruence ➤ SAS Triangle Congruence ➤ ASA Triangle Congruence ➤ AAS Triangle Congruence 	<p>Unit 4 – Parallelograms</p> <ul style="list-style-type: none"> ➤ Properties of Parallelograms ➤ Proving a Quadrilateral is a Parallelogram ➤ Proofs with Parallelograms ➤ Proofs with Trapezoids ➤ Constructions with Parallelograms ➤ Mid-Segment Theorem <p>Unit 5 – Similarity</p> <ul style="list-style-type: none"> ➤ Scale Drawings and Similarity ➤ Scale Drawings Using the Ratio Method ➤ Dilations on the Coordinate Plane ➤ Dilations Mapping Segments, Lines, Rays and Circles ➤ Dilations Mapping Angles ➤ Similarity Transformations ➤ Similarity Criteria for Triangles - AA ➤ Similarity Criteria for Triangles - SAS and SSS 	<p>Unit 6 – Right Triangles and Introduction to Trigonometry</p> <ul style="list-style-type: none"> ➤ Simplifying, Multiplying, & Dividing Radicals ➤ Adding & Subtracting Radicals ➤ The Pythagorean Theorem ➤ Trigonometric Ratios Sine, Cosine and Tangent ➤ Sine and Cosine of Complementary Angles ➤ Trigonometric Ratios to Find Missing Sides ➤ Trigonometric Ratios to Find Missing Angles ➤ Angle of Elevation/Depression <p>Unit 7 – Three Dimensional Figures</p> <ul style="list-style-type: none"> ➤ Perimeter and Area ➤ Circumference and Area of a Circle ➤ Arc Length and Area of Sectors ➤ General Prisms & Cylinders and their Cross-Sections ➤ General Cones & Pyramids and their Cross-Sections ➤ Finding Volumes ➤ Volume of Composite Figures ➤ Density 	<p>Unit 8 – Coordinate Geometry</p> <ul style="list-style-type: none"> ➤ Equation of a line point-slope form ➤ Parallel and Perpendicular Lines ➤ Dividing Segments Proportionally ➤ Equations of the Perpendicular Bisector ➤ The Distance Formula ➤ Coordinate Proofs Triangles ➤ Coordinate Proofs Quadrilaterals <p>Unit 9 – Circles</p> <ul style="list-style-type: none"> ➤ Equation of a Circle, Center-Radius Form ➤ Equation of a Circle, Standard Form ➤ Circle Terminology ➤ Inscribed Angles ➤ Intersecting Chords ➤ Secants and Tangents (Angles) ➤ Secants and Tangents (Segments) ➤ Circle Proofs

Algebra II (Advanced) Curriculum Map
Prerequisite: Geometry

Grade: 11
Full Year Course

Semester 1		Semester 2	
<p>Unit 1 – Polynomials</p> <ul style="list-style-type: none"> ➤ Multiplying polynomials ➤ Dividing polynomials ➤ Factoring polynomials <ul style="list-style-type: none"> • Greatest common factor • Difference of perfect squares • Difference of perfect cubes • Trinomials $a = 1$ and $a \neq 1$ • Grouping • The zero product Property <p>Unit 2 – Polynomial Functions</p> <ul style="list-style-type: none"> ➤ Key features of polynomial graphs ➤ Zeros of a polynomial ➤ Graphing polynomials ➤ Dividing polynomials with remainders ➤ The complex numbers ➤ Operations with complex numbers ➤ Complex numbers as solutions to an equation ➤ Polynomial functions with complex zeros <p>Unit 3 – Rational, Radical and Systems of Equations</p> <ul style="list-style-type: none"> ➤ Equivalent rational expressions ➤ Solving rational equations ➤ Solving radical equations ➤ Quadratic-linear systems ➤ Linear systems 3 by 3 <p>Unit 4 – Functions</p> <ul style="list-style-type: none"> ➤ Transformations of functions ➤ Even and odd functions ➤ Average rate of change ➤ Inverse functions ➤ Solving equations graphically ➤ Regression 	<p>Unit 5 – Trigonometric Functions</p> <ul style="list-style-type: none"> ➤ Trigonometric ratios ➤ Properties of the unit circle ➤ Reference angles ➤ Extending the domain of sine and cosine ➤ Radian angle measure ➤ Properties of the tangent function ➤ The reciprocal functions ➤ Pythagorean Identity ➤ Graphing sine and cosine functions <ul style="list-style-type: none"> • Amplitude • Midline • Frequency • Period • Phase Shift ➤ Modeling with sine and cosine functions 	<p>Unit 6 – Exponential and Logarithmic Functions</p> <ul style="list-style-type: none"> ➤ Properties of exponents ➤ Rational exponents and radicals ➤ Exponential functions and their graphs ➤ Inverse of exponential functions ➤ Graphing logarithmic functions ➤ Solving exponential equations ➤ Compounding interest ➤ Modeling with exponential and logarithmic functions ➤ Creating equivalent models <p>Unit 7 – Sequences and Series</p> <ul style="list-style-type: none"> ➤ Arithmetic and Geometric sequences ➤ Recursively defined sequences ➤ Summation notation ➤ Arithmetic Series ➤ Geometric Series ➤ Applications of Geometric Series <p>Unit 8 – Probability</p> <ul style="list-style-type: none"> ➤ Two-way tables ➤ Basic probability ➤ Conditional probability ➤ Independent events ➤ Venn diagrams ➤ The rules of probability 	<p>Unit 9 – Inferential Statistics</p> <ul style="list-style-type: none"> ➤ Types of statistical studies ➤ Estimating parameters ➤ The Normal distribution ➤ Sampling distributions ➤ Sample proportions ➤ Margin of error for proportions ➤ Sample means ➤ Margin of error for means ➤ Difference of sample means <p>Regents Review</p> <p>*This advanced section of this course will cover these topics along with additional topics that vary year to year based on student ability. These additional topics will provide the advanced students a deeper understanding of the units covered in this course.</p>

Semester 1		Semester 2	
<p>Discretionary Expenses</p> <ul style="list-style-type: none"> ➤ Measures of central tendency ➤ Cumulative & relative frequency ➤ Deviation ➤ Normal curve ➤ Z-scores ➤ Correlation vs. causation ➤ Scatterplots & regression <p>Automobile Ownership</p> <ul style="list-style-type: none"> ➤ Percents ➤ Piecewise functions ➤ Literal equations & inequalities ➤ Two-way tables, conditional probability, independence, & Venn diagrams ➤ Linear & exponential depreciation ➤ Ratios ➤ Quadratic braking formula ➤ Square root skid speed formula 	<p>Employment Basics</p> <ul style="list-style-type: none"> ➤ Arithmetic & geometric sequences ➤ Exponential functions ➤ Graphs of functions ➤ Literal equations ➤ Piecewise functions ➤ Spreadsheets & formulas <p>Income Taxes</p> <ul style="list-style-type: none"> ➤ Domains ➤ Inequalities & compound inequalities ➤ Tax piecewise functions ➤ Graphing piecewise functions ➤ Interval notation ➤ Slope-intercept form of linear equations 	<p>Banking Services</p> <ul style="list-style-type: none"> ➤ Simple interest formula ➤ Spreadsheets ➤ Compound interest ➤ Limit as x approaches infinity ➤ e as a limit ➤ Compounding continuously ➤ Logarithms including change of base & power property <p>Consumer Credit</p> <ul style="list-style-type: none"> ➤ Monthly payment formula ➤ Calculating payments & interest due ➤ Daily interest formula ➤ Logarithms ➤ Cubic regression ➤ Scatterplots ➤ Computing average daily balance 	<p>Independent Living</p> <ul style="list-style-type: none"> ➤ Apothem ➤ Trigonometric ratios ➤ Area & circumference ➤ Pythagorean theorem ➤ Linear & exponential regressions ➤ Perimeter ➤ Volume ➤ Similar triangles ➤ Systems of linear equations <p>Preparing a Budget</p> <ul style="list-style-type: none"> ➤ Rational functions ➤ Piecewise & greatest integer functions ➤ Line, bar, & circle graphs ➤ Spreadsheets ➤ Matrix operations

Quarter 3	Quarter 4
<p>EXPONENTIAL AND LOGISTIC MODELING (1, 4,5,6)</p> <ul style="list-style-type: none">➤ Euler Number➤ The Natural Logarithm➤ Exponential Growth and Decay Problems➤ Math Finance <p>INTRODUCTION TO CALCULUS (1,3,4,5,6,9,13)</p> <ul style="list-style-type: none">➤ Limits➤ Delta process➤ Differentiation➤ Power➤ Product rule➤ Quotient rules➤ Max - Min problems➤ Related Rate problems➤ Motion, Velocity, Acceleration	<p>INTRODUCTION TO CALCULUS (1,3,4,5,6,9,13)</p> <p>Derivatives</p> <ul style="list-style-type: none">➤ Graphically➤ Concavity, POI, Inc/Dec Intervals <p>Integration</p> <ul style="list-style-type: none">➤ Indefinite integral➤ Definite integral➤ Area under curve➤ Area between two curves <p>Review for final exam</p>

Quarter 3	Quarter 4
<p>POLAR COORDINATES</p> <ul style="list-style-type: none">➤ Conversion into Polar Coordinates➤ Graphs of Polars <p>INTRODUCTION TO CALCULUS</p> <p>BASIC DERIVATIVES</p> <ul style="list-style-type: none">➤ Limits➤ Differentiation➤ Power➤ Product rule➤ Quotient rules➤ Chain rule➤ Implicit differentiation➤ Max and Min problems➤ Related rate problems➤ Motion, Velocity, Acceleration <p>TRIGONOMETRY DERIVATIVES</p> <ul style="list-style-type: none">➤ Basic Trig Derivatives/Rules➤ Chain Rule➤ Implicit Differentiation➤ Derivatives of Inverse Sine and Tangent	<p>INTRODUCTION TO CALCULUS</p> <p>TRIGONOMETRY DERIVATIVES</p> <ul style="list-style-type: none">➤ Basic Trig Derivatives/Rules➤ Chain Rule➤ Implicit Differentiation➤ Derivatives of Inverse Sine and Tangent <p>DERIVATIVES OF EXPONENTIAL AND LOGARITHMIC FUNCTIONS</p> <ul style="list-style-type: none">➤ Derivatives of Exponential Functions➤ Derivatives of Logarithmic Functions <p>Review for Final exam</p>

Semester 1		Semester 2	
<p>FUNCTIONS & GRAPHS</p> <ul style="list-style-type: none"> ➤ Inequalities ➤ Absolute Value ➤ Distance & Midpoint ➤ Equation of line ➤ Symmetry ➤ Domain & Range ➤ Classifying functions <p>LIMITS & CONTINUITY</p> <ul style="list-style-type: none"> ➤ Limits to infinity ➤ Right and left hand limits ➤ Constant, sum, product and quotient limits ➤ Asymptotes ➤ Non-existent limits <p>CONTINUITY</p> <ul style="list-style-type: none"> ➤ Definition ➤ Graphical interpretation ➤ Absolute extrema ➤ Intermediate value theorem <p>DIFFERENTIAL CALCULUS</p> <ul style="list-style-type: none"> ➤ Definition of derivative ➤ Derivative of algebraic functions product, quotient rule, chain rule ➤ Derivative of trig function implicit differentiation 	<p>DIFFERENTIAL CALCULUS</p> <ul style="list-style-type: none"> ➤ Higher order derivative ➤ Differentiability & continuity ➤ Exponential and log derivatives ➤ Inverse sine and tangent derivative <p>APPLICATIONS OF DERIVATIVE</p> <ul style="list-style-type: none"> ➤ Slope of tangent and normal intervals ➤ Concavity ➤ Point of inflection ➤ Curve sketching ➤ Linear approximation ➤ Rolle's Theorem ➤ Mean Value Theorem ➤ Related rate problems ➤ Absolute extrema ➤ Curve sketching ➤ Applied extrema problems ➤ Average & instantaneous rate of change ➤ Rectilinear motion 	<p>INTEGRAL CALCULUS</p> <ul style="list-style-type: none"> ➤ antiderivative ➤ applications to distance and velocity ➤ definite integral ➤ Fundamental Theorem of Calculus ➤ approximate of definite integral ➤ slope fields ➤ rectangular approximation ➤ LRAM,RRAM,MRAM, Trapezoidal 	<p>APPLICATIONS OF INTEGRATION</p> <ul style="list-style-type: none"> ➤ Continuous growth problems ➤ Integrals as an accumulator areas ➤ average value of function ➤ volumes of solids - cross sections ➤ volumes of revolution - discs, washers and shells <p>REVIEW FOR AP EXAM</p> <p>Long Term Project after the AP exam in May</p>

Semester 1		Semester 2	
<p>Exploring Data</p> <p>I. Interpreting graphical displays of distributions of univariate data</p> <ul style="list-style-type: none"> Center, spread, shape Outliers and other unusual features <p>II. Summarizing distributions of univariate data</p> <ul style="list-style-type: none"> Center; median, mean Spread, range, IQR, standard deviation quartiles, percentiles, standardized scores and boxplots <p>III. Comparing distributions of univariate data</p> <ul style="list-style-type: none"> Comparing center and spread; within group and between groups, clusters and gaps, outliers and other unusual features Comparing shapes <p>IV. Exploring bivariate data</p> <ul style="list-style-type: none"> Scatterplots Correlation, linearity, LSRL Residual plots Outliers, influential points Transformations <p>Exploring categorical data</p>	<p>Planning a Study</p> <p>I. Overview of methods of data collection</p> <p>II. Planning & conducting surveys</p> <ul style="list-style-type: none"> Well designed and conducted surveys Populations, samples, and random selection, bias <p>III. Plan & conduct experiments</p> <ul style="list-style-type: none"> Treatments, control groups, experimental units, random assignments, and replication Sources of bias and confounding variables Placebo effect and blinding experimental design Randomization <p>IV. Generalizing results from observational and experimental studies, and surveys</p> <p>Anticipating Patterns</p> <p>I. Probability as relative frequency</p> <ul style="list-style-type: none"> “Law of large numbers” Addition rule, multiplication rule, conditional probability, and independence Discrete random variables Simulation Expected value 	<p>II. Combining independent random variables</p> <ul style="list-style-type: none"> Independence, mean & standard deviation of random variables sums <p>III. The normal distribution</p> <p>IV. Sampling distributions</p> <ul style="list-style-type: none"> Sample proportions, means Central limit theorem Difference between two independent sample proportions and means Simulations <p>Statistical Inference</p> <p>I. Large Sample Confidence intervals</p> <ul style="list-style-type: none"> Proportions and means <p>II. Tests of significance</p> <ul style="list-style-type: none"> Logic of significance testing, null & alternative hypotheses; p-values; one- and two-sided tests; concepts of Type I and Type II errors; concept of power <p>Large sample test for a proportions and means</p>	<ul style="list-style-type: none"> Chi-squares test for goodness of fit, homogeneity of proportions, and independence (one- and two- way tables) <p>III. Special case of normally distributed data</p> <ul style="list-style-type: none"> T-distribution Single sample t score procedures Two sample t score procedures Independent and matched pairs for a two sample t test Inference for the slope of least-squares regression line from computer outputs <p>Review for AP Exam</p> <p>Long term statistical project</p>

Semester 1		Semester 2	
<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
<p><u>Unit 1-Primitive Types</u> -Inputs and outputs in Java. -Data Types -Numeric Calculations (add/subt/mult/divide) -Numeric Casting</p> <p><u>Unit 2-Using Objects</u> -Strings and Class Types -Escape Sequences and String Concatenation -String Methods -Classes and Objects -Constructors and Methods -Wrapper Classes -Math Functions</p> <p><u>Unit 3-Boolean Expressions and if Statements</u> -Simple Ifs -Relational Operators -Else -Logical Operators and Truth Tables -Short Circuit Evaluation and DeMorgan's Law -Comparing Objects</p>	<p><u>Unit 4-Iteration</u> -While Loops and Tracing Code -Algorithms for Numbers -For Loops -Algorithms for Strings -Nested Loops -Algorithm Efficiency</p> <p><u>Unit 5-Writing Classes</u> -Void Methods -Parameters (class vs primitive) -Return Methods -Constructors -Documenting a Class -Static vs Instance -Wider Impacts of Computing</p> <p><u>Unit 6-Array</u> -What are 1-D Arrays -Traversing an Array -Arrays of Strings -Algorithms on Arrays -Enhanced For Loop (For Each) -</p>	<p><u>Unit 7-ArrayList</u> -What are ArrayLists -Traversing ArrayLists -Array Algorithms with ArrayLists -Linear Search -Selection Sort -Insertion Sort -Wider Impacts of Data Collection</p> <p><u>Unit 8-2-D Array</u> -What are 2-D Arrays -2-D Array Algorithms</p> <p><u>Unit 9-Inheritance</u> -What is Inheritance -Inheritance Overriding Methods -Is-a/Has-a Relationships</p> <p><u>Unit 10-Recursion</u> -What is Recursion -Recursive Functions with Returns -Binary Search -Merge Sort</p>	<p><u>Unit 11-AP Exam Prep</u> -Multiple Choice Review -Free Response Review</p> <p><u>Post AP Project</u></p>

Quarter 1	Quarter 2
<p>FUNCTIONS AND GRAPHS</p> <ul style="list-style-type: none">➤ Domain and Range➤ Functions and their Properties➤ Classifications of Basic Functions➤ Applications of Piecewise Functions➤ Transformations including Vertical/Horizontal Shifts, Line Reflections➤ Horizontal and Vertical Asymptotes➤ Symmetries of Functions➤ Modeling with Functions <p>POLYNOMIAL, POWER AND RATIONAL FUNCTIONS</p> <ul style="list-style-type: none">➤ Slope-intercept and point-slope formulas➤ Modeling with Linear and Quadratic Functions➤ Modeling with Power Functions➤ Finding Roots of Higher Degree Functions➤ Pattern, Degree, End Behavior➤ Intervals where Functions are Inc/Dec➤ Local and Global Max and Min➤ Optimizations Problems	<p>LINEAR PROGRAMMING</p> <ul style="list-style-type: none">➤ Finding Max and Min values of a function➤ Solving Linear Programming Word Problems➤ Graphing inequalities <p>MATRICES</p> <ul style="list-style-type: none">➤ Operations, add, subtract, multiply➤ Inverse➤ Equations➤ Applications <p>CONIC SECTIONS</p> <ul style="list-style-type: none">➤ Circle➤ Parabola➤ Hyperbola➤ Ellipse➤ Application problems <p>PARAMETRIC EQUATIONS</p> <ul style="list-style-type: none">➤ Algebraic solution➤ Graphical solution use to model motion <p>SUNY 121 Final exam review</p>

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<p>FUNCTIONS AND GRAPHS</p> <ul style="list-style-type: none">➤ Domain and Range➤ Functions and their Properties➤ Classifications of Basic Functions➤ Applications of Piecewise Functions➤ Transformations including Vertical/Horizontal Shifts, Line Reflections➤ Horizontal, Vertical, Slant and End Behavior Asymptotes➤ Symmetries➤ Modeling with Functions <p>POLYNOMIAL, POWER AND RATIONAL FUNCTIONS</p> <ul style="list-style-type: none">➤ Slope-intercept and point-slope formulas➤ Modeling with Linear and Quadratic Functions➤ Modeling with Power Functions➤ Finding Roots of Higher Degree Functions➤ Complex Roots➤ Pattern, Degree, End Behavior➤ Intervals where Functions are Inc/Dec➤ Local and Global Max and Min➤ Optimizations Problems	<p>EXPONENTIAL AND LOGISTIC MODELING</p> <ul style="list-style-type: none">➤ Euler Number➤ The Natural Logarithm➤ Exponential Growth and Decay Problems➤ Math Finance <p>MATRICES</p> <ul style="list-style-type: none">➤ Add, subtract, multiply➤ Inverse➤ Equations➤ Applications <p>CONIC SECTIONS</p> <ul style="list-style-type: none">➤ Circle➤ Parabola➤ Hyperbola➤ Ellipse➤ Application problems <p>PARAMETRIC EQUATIONS</p> <ul style="list-style-type: none">➤ Algebraic solution➤ Graphical solution use to model motion <p>SUNY Math 121 Final Exam</p>