

Grade: 9

Subject: Algebra I

Department: Math

Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<p>Students will:</p> <ul style="list-style-type: none">• Write and simplify algebraic expressions involving exponents and use the order of operations to evaluate• Solve one-step, two-step, multi-step equations, and equations with variables on both sides• Solve one-step, two-step, multi-step inequalities, and inequalities with variables on both sides• Use graphs to relate two quantities• Define and classify functions• Determine and write linear functions	<p>Strategies for:</p> <ul style="list-style-type: none">• Performing operations on algebraic expressions and classifying properties of real numbers• Solving equations by applying properties of equalities• Solving inequalities by using properties of inequalities and sketching the graph• Writing, graphing and formalizing functions• Analyzing and writing linear functions in the form of slope-intercept form, point-slope form, standard form and two point form• Solving and applying systems of linear	<p>Use of:</p> <ul style="list-style-type: none">• ELMO/projector/ smart board• Board work• Handouts• Worksheets	<p>Use of:</p> <ul style="list-style-type: none">• Homework• Classwork• Participation• Quizzes• Test• Final Exam

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<ul style="list-style-type: none"> ● Solve systems of linear equations and inequalities that involves two and three equations ● Perform operations on polynomials ● Factor polynomials 	<p>equations and inequalities</p> <ul style="list-style-type: none"> ● Simplifying polynomials by combining like and unlike terms ● Simplifying polynomials by multiplying ● Finding the factors of polynomials by division and factoring 		

Grades: 10 – 12

Subject: AP/Calculus AB/Mathematics

Department: Math

Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<p>Students will:</p> <ul style="list-style-type: none">• Calculate average and instantaneous speeds and define limits for function values and apply the properties of limits• Use the rules of differentiation to calculate derivatives of algebraic, trigonometric, logarithmic and exponential functions, including second and higher order derivatives, use derivatives to analyze straight line motion and solve other problems involving rate of change• Determine the local or global extreme values of a function, and define Mean Value Theorem• Approximate and interpret as a definite integral the area under the graph of a	<p>Strategies for:</p> <ul style="list-style-type: none">• Finding the average and instantaneous speeds through the use of properties of limits• Solving the first and higher derivatives using the rules of differentiation given algebraic, trigonometric, logarithmic and exponential functions• Applying the Mean Value Theorem• Finding the intervals on which a function is increasing or decreasing• Using the First and Second Derivatives Tests to determine the local extreme values and concavity of a function• Applying rules for definite integral and Fundamental	<p>Use of:</p> <ul style="list-style-type: none">• ELMO/projector/ smart board• Board work• Handouts• Worksheets• Practice AP Exams	<p>Use of:</p> <ul style="list-style-type: none">• Homework• Classwork• Participation• Quiz• Test• Final Exam

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<p>nonnegative continuous function by using rectangle approximation methods and limit of Riemann sums</p> <ul style="list-style-type: none"> ● Construct slope fields ● Solve problems in which a rate is integrated to find the net change over time in variety of applications 	<p>Theorem of Calculus</p> <ul style="list-style-type: none"> ● Finding the average value of a function over a closed interval ● Drawing slope fields and interpreting it as visualization of different equations ● Using integration techniques to solve word problems involving planes and volumes 		

Grades: 8, 10 – 12

Subject: Pre-Calculus Honors/Mathematics

Department: Math

Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<p>Students will:</p> <ul style="list-style-type: none">● Identify the properties of functions and draw its graph● Differentiate the types and graphs of linear from quadratic functions● Identify polynomial function, its degree, real zeros and graph using transformations● Define and graph exponential and logarithmic functions● Find the exact trigonometric values● Find the values of inverse trigonometric functions and solve identities	<p>Strategies for:</p> <ul style="list-style-type: none">● Finding the value and domain of a function and illustrating the graph of a function using transformations● Graphing linear and quadratic functions, building linear and quadratic models, and solving inequalities involving linear quadratic functions● Drawing and analyzing rational functions, and solving rational equations and inequalities● Solving and illustrating the graphs of exponential and logarithmic function● Drawing the unit circle and determining its parts and properties	<p>Use of:</p> <ul style="list-style-type: none">● ELMO/projector/ smart board● Board work● Handouts● Worksheets	<p>Use of:</p> <ul style="list-style-type: none">● Homework● Classwork● Participation● Quiz● Test● Final Exam

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
	<ul style="list-style-type: none"><li data-bbox="619 329 997 467">• Solving the inverse trigonometric values using the unit circle and identities		

Grades: 9 - 10

Subject: Geometry Honors/Mathematics

Department: Math

Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<p>Students will:</p> <ul style="list-style-type: none">● Recognize points, lines, line segments, rays, angles and triangles● Understand the concept of perpendicularity, complementary angles and supplementary angles● Determining congruent triangles● Find the slope of lines and determine whether its parallel or perpendicular lines● Define and identify the types of polygons● Define and graph a circle	<p>Strategies for:</p> <ul style="list-style-type: none">● Defining the points, lines, line segments, rays, angles and triangles● Writing simple two-column proofs● Differentiating complementary and supplementary angles, and using these in drawing conclusions● Proving congruent triangles by SSS, SAS and ASA● Proving corresponding parts of triangles by CPCTC, AS and HL theorems● Solving the slope of lines for parallel or perpendicular lines to	<p>Use of:</p> <ul style="list-style-type: none">● ELMO/projector/ smart board● Board work● Handouts● Worksheets	<p>Use of:</p> <ul style="list-style-type: none">● Homework● Classwork● Participation● Quiz● Test● Final Exam

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
	<p>prove whether a quadrilateral is a parallelogram</p> <ul style="list-style-type: none">● Writing two-column proofs for polygons● Recognizing the special relationships between radii and chords, and identifying the relationships of circles		

Grade: 12

Subject: Calculus Honors/Mathematics

Department: Math

Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<p>Students will:</p> <ul style="list-style-type: none">● Calculate average and instantaneous speeds and define limits for function values and apply the properties of limits● Use the rules of differentiation to calculate derivatives of algebraic, trigonometric, logarithmic and exponential functions, including second and higher order derivatives, use derivatives to analyze straight line motion and solve other problems involving rate of change● Determine the local or global extreme values of a function, and define Mean Value Theorem	<p>Strategies for:</p> <ul style="list-style-type: none">● Finding the average and instantaneous speeds through the use of properties of limits● Solving the first and higher derivatives using the rules of differentiation given algebraic, trigonometric, logarithmic and exponential functions● Applying the Mean Value Theorem● Finding the intervals on which a function is increasing or decreasing● Using the First and Second Derivatives Tests to determine the local extreme values and concavity of a function	<p>Use of:</p> <ul style="list-style-type: none">● ELMO/projector/ smart board● Board work● Handouts● Worksheets	<p>Use of:</p> <ul style="list-style-type: none">● Homework● Classwork● Participation● Quiz● Test● Final Exam

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<ul style="list-style-type: none"> ● Approximate and interpret as a definite integral the area under the graph of a nonnegative continuous function by using rectangle approximation methods and limit of Riemann sums ● Construct slope fields ● Solve problems in which a rate is integrated to find the net change over time in variety of applications 	<ul style="list-style-type: none"> ● Applying rules for definite integral and Fundamental Theorem of Calculus ● Finding the average value of a function over a closed interval ● Drawing slope fields and interpreting it as visualization of different equations ● Using integration techniques to solve word problems involving planes and volumes 		

Grades: 10 and 11
Subject: Algebra 2
Department: Math
Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<p>Students will:</p> <ul style="list-style-type: none"> ● Solve linear equations ● Write equations for and graph lines ● Solve systems of linear equations ● Solve inequalities and systems of inequalities ● Factor polynomials and solve polynomial equations ● Combine rational expressions and solve rational equations ● Simplify exponential and radical expressions ● Solve radical equations ● Graph quadratic functions and solve quadratic equations 	<p>Strategies for:</p> <ul style="list-style-type: none"> ● Clearing fractions and decimals ● Solving for a variable in a formula ● Solving consecutive integer and uniform motion problems ● Solving systems by substitution and elimination ● Solving word problems with systems of equations ● Solving linear programming problems ● Multiplying and dividing polynomials ● Factoring polynomials ● Solving polynomial equations 	<p>Use of:</p> <ul style="list-style-type: none"> ● Individual lap boards ● Boardwork ● Lecture ● Discussion 	<p>Use of:</p> <ul style="list-style-type: none"> ● Graded homework ● Graded classwork ● Quizzes ● Tests ● Participation

Grades: 10 and 11
Subject: Algebra 2
Department: Math
Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
	<ul style="list-style-type: none">● Multiplying, dividing, adding and subtracting rational expressions● Solving word problems with rational equations● Multiplying, adding, subtracting, and dividing radical expressions● Using the quadratic formula● Finding maximum and minimum values of quadratic functions● Solving quadratic inequalities		

Grade: 9-12

Subject: Honors Algebra II

Department: Math

Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<p>Students will:</p> <ul style="list-style-type: none">● Solve linear equations and inequalities● Graph and write equations for linear and absolute value functions● Solve systems of linear equations and inequalities● Study quadratic functions● Work with polynomial functions● Work with radical functions● Study exponential and logarithmic functions	<p>Strategies for:</p> <ul style="list-style-type: none">● Setting up and solving consecutive integer, mixture, and uniform motion problems● Solving direct variation problems● Optimizing through linear programming● Completing the square and using the quadratic formula● Finding maximum and minimum values of quadratic functions● Multiplying and dividing polynomials● Factoring polynomials	<p>Use of:</p> <ul style="list-style-type: none">● Lecture● Discussion● Boardwork	<p>Use of:</p> <ul style="list-style-type: none">● Graded homework● Classwork● Quizzes● Tests● Participation

Grade: 9-12

Subject: Honors Algebra II

Department: Math

Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<ul style="list-style-type: none">• Work with rational functions• Study conic sections	<ul style="list-style-type: none">• Simplifying radical expressions• Working with rational exponents and laws of exponents• Solving radical equations• Graphing exponential and logarithmic functions• Simplifying logarithmic expressions using laws of logarithms• Solving exponential and logarithmic equations• Simplifying, multiplying, dividing, adding, and subtracting rational expressions		

Grade: 9-12

Subject: Honors Algebra II

Department: Math

Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
	<ul style="list-style-type: none">● Solving rational equations● Solving rate and inverse variation problems● Writing equations for conic sections and their transformations		

Grades: 9 and 10
Subject: Geometry
Department: Math
Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<p>Students will:</p> <ul style="list-style-type: none"> ● Recognize the properties and applications of common geometric figures in two and three dimensions ● Understand transformations and right-triangle trigonometry ● Develop inductive and deductive thinking skills to problem-solve in various real-world situations 	<p>Strategies for:</p> <ul style="list-style-type: none"> ● Explaining why a mathematical statement is true or false or where a mathematical rule comes from ● Justifying their thinking and critiquing the reasoning of others to become proficient thinkers and problem-solvers ● Making sense of problems, developing solutions plans and using tools appropriately to lead to mathematical proficiency 	<p>Use of:</p> <ul style="list-style-type: none"> ● Discussions in pairs, groups or class ● Overhead projection of examples and problems to analyze ● Round-robin reading aloud and reflection of lesson concepts 	<p>Use of:</p> <ul style="list-style-type: none"> ● Monthly tests: multiple choice, short answer, picture labeling and identification of parts ● Monthly quizzes (same question types as above) ● Daily homework checking

Grade: 9-12
Subject: Pre-Calculus
Department: Math
Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<p>Students will:</p> <ul style="list-style-type: none"> ● Review fundamental concepts of algebra 1 ● Solve equations and inequalities ● Work with functions and graphs ● Work with polynomial and rational functions ● Work with exponential and logarithmic functions ● Understand trigonometric functions ● Apply trigonometry to polar coordinates and vectors 	<p>Strategies for:</p> <ul style="list-style-type: none"> ● Solving linear, quadratic, rational, and radical equations ● Finding equations of lines and graphing linear functions ● Graphing transformations of basic functions ● Combining functions ● Graphing polynomials and rational functions ● Solving polynomial and rational inequalities ● Simplifying logarithmic expressions and solving exponential and logarithmic equations 	<p>Use of:</p> <ul style="list-style-type: none"> ● Lecture ● Lap white boards ● Boardwork ● Discussion 	<p>Use of:</p> <ul style="list-style-type: none"> ● Graded homework ● Quizzes ● Exams ● Discussion

Grade: 9-12
Subject: Pre-Calculus
Department: Math
Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<ul style="list-style-type: none">• Solve systems of equations and inequalities	<ul style="list-style-type: none">• Solving right triangles• Finding trigonometric functions of any angle• Graphing trigonometric functions• Solving trigonometric equations• Applying trigonometry• Solving systems of linear and non-linear equations		

Grades: 9-12
Subject: AP Calculus BC
Department: Math
Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<p>Students will:</p> <ul style="list-style-type: none"> ● Understand the concept of a limit ● Understand the concept of a derivative ● Apply differentiation ● Understand the concept of an antiderivative and a definite integral ● Apply integration ● Understand the concept of an infinite series ● Work with functions defined parametrically ● Work with vectors and vector-valued functions 	<p>Strategies for:</p> <ul style="list-style-type: none"> ● Calculating limits ● Applying rules of differentiation ● Solving related rates and optimization problems ● Sketching curves ● Evaluating definite and indefinite integrals using standard techniques of integration ● Calculating areas, volumes and arc lengths ● Solving differential equations ● Testing convergence of infinite series ● Representing functions as power series 	<p>Use of:</p> <ul style="list-style-type: none"> ● Interactive lecture ● Discussion ● Boardwork ● Video clips ● Practice AP exams 	<p>Use of:</p> <ul style="list-style-type: none"> ● Graded homework ● Quizzes ● Exams ● Participation

Grades: 9-12

Subject: AP Calculus BC

Department: Math

Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
	<ul style="list-style-type: none">• Approximating using Taylor polynomials• Describing motion in space		

Grade: 12
Subject: Quantitative Reasoning
Department: Mathematics
Division: Upper School

LEARNING OBJECTIVES	SKILLS	INSTRUCTIONAL TECHNIQUES	EVALUATION
<p>Students will:</p> <ul style="list-style-type: none"> ● Acquire knowledge of fundamental mathematics and solve authentic problems that apply to their lives ● Understand and reason with quantitative issues and mathematical ideas they are likely to encounter in college, career, and life ● Develop problem-solving skills, while fostering critical thinking, within an interesting setting 	<p>Strategies for:</p> <ul style="list-style-type: none"> ● Explaining why a mathematical statement is true or false or where a mathematical rule comes from ● Justifying their thinking and critiquing the reasoning of others to become proficient thinkers and problem-solvers ● Making sense of problems, developing solutions plans and using tools to lead to mathematical proficiency 	<p>Use of:</p> <ul style="list-style-type: none"> ● Discussions in pairs, groups or class ● Overhead projection of examples and problems to analyze ● Round-robin reading aloud and reflection of lesson concepts ● Graphing calculators and appropriate technology 	<p>Use of:</p> <ul style="list-style-type: none"> ● Monthly tests: multiple choice, short answer, picture labeling and identification of parts ● Monthly quizzes (same question types as above) ● Daily homework checking