

Algebra 2

(2008-2009 ACADEMIC YEAR)

Scope and Sequence

Organizing Topic	Essential Knowledge and Skill <i>The student will be able to:</i>	Strategies	Assessment Methods	Resources
Operations	Identify the kinds of numbers in the real number system.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	TI-83 Plus Calculator Activities 1. Introduction 2. Evaluating formulas
	Demonstrate the properties of real numbers.			
	Apply the order of operations.			
	Classify polynomials by terms and degree.			
	Perform the four basic operations with polynomials.			
	State and use the laws of exponents.			
Factor polynomials completely.				
Linear Equations	Identify the properties of equality.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	TI-83 Plus Calculator Activities 1. Graphing absolute value equations 2. Finding the line of best fit given a set of statistical data and graphing it 3. Modeling a linear equation to the data collected from the men's Olympic 400m dash and using it to predict future times Video Watch video interview with pharmacist using mixture problems.
	Solve linear equations and inequalities.			
	Solve absolute value equations and inequalities.			
	Solve various types of word problems.			
Linear Relations	Define and recognize functions and relations.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	TI-83 Plus Calculator Activities 1. Graphing slope and y-intercepts 2. Modeling a linear equation to the data collected from the National Cancer Institute and using it to recognize trends and make predictions
	Find the domain and range of a relation.			
	Use function notation.			
	Determine the slope of a line.			
	Graph lines and linear inequalities.			
	Find equations of lines.			
	Recognize several special functions.			
	Perform operations with functions.			
	Find the distance and midpoint between two points.			

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Scope and Sequence (continued)

Organizing Topic	Essential Knowledge and Skill <i>The student will be able to:</i>	Strategies	Assessment Methods	Resources
Quadratic Equations	Solve quadratic equations by factoring.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	TI-83 Plus Calculator Activities 1. Solving quadratic equations graphically to find the roots 2. Modeling a quadratic equation to data collected during Galileo's grooved ramp experiment and evaluating the model for additional observations 3. Programming the TI-83 to solve the quadratic formula Worksheet Activity Deriving the quadratic formula by completing the square on the standard quadratic equation
	State and use the zero product property.			
	Solve quadratic equations by completing the square.			
	State, prove, and apply the quadratic formula.			
	Find the discriminant, and use it to classify solutions to a quadratic equation.			
	Solve problems involving quadratic equations.			
Polynomial Functions	Distinguish between equations and functions, both linear and quadratic.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	TI-83 Plus Calculator Activities 1. Analyzing quadratic functions 2. Finding zeros of polynomial functions 3. Distinguishing graphs of polynomial functions of differing degrees 4. Evaluating different models for the growth rate of infants
	Find the vertex and the axis of symmetry of a quadratic function.			
	Graph and translate quadratic functions.			
	Solve maximum and minimum problems using quadratic functions.			
	Graph quadratic inequalities.			
	Find the zeros of functions.			
	Apply the factor and remainder theorems.			
	Graph polynomial functions.			

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Scope and Sequence (continued)

Organizing Topic	Essential Knowledge and Skill <i>The student will be able to:</i>	Strategies	Assessment Methods	Resources
Systems of Equations and Inequalities	Solve a system of linear equations by three methods – graphing, substitution, and addition.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	TI-83 Plus Calculator Activity Solving systems of quadratic equations graphically
	Determine if 2 equations have 1 solution, no solutions, or infinitely many solutions.			
	Solve word problems using systems of equations.			
	Solve systems of inequalities.			
	Solve linear programming problems.			
	Solve systems of quadratic equations.			
Radicals	Define and apply rational exponents.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	TI-83 Plus Calculator Activity Comparing a linear model to an exponential model for the consumer price index of the 20 th century Video Watch video interview with policeman demonstrating how radicals are used in accident reconstruction.
	State the exponent properties.			
	Simplify radical expressions.			
	Add, subtract, multiply, and divide radical expressions.			
	Add, subtract, multiply, and divide exponential expressions.			
	Graph radical and exponential functions.			
	Solve radical equations and equations with radicals.			
Solve exponential equations and equations with exponents.				
Complex Numbers	Define imaginary numbers and complex numbers.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	TI-83 Plus Calculator Activities Using the data collected from a baseball throw from center field to fit a quadratic model and then using it to predict the reasonableness of different feats
	Perform the four basic operations of addition, subtraction, multiplication, and division with complex numbers.			
	Solve quadratic equations that have complex numbers as roots.			
	Graph complex numbers on a complex plane.			
	Use vectors to represent and add complex numbers.			
Rational Expressions and Equations	Simplify rational expressions.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	TI-83 Plus Calculator Activity Exploring the degrees, asymptotes, and zeros of rational equations
	Perform the four basic operations with rational expressions.			
	Graph rational functions.			
	Solve rational equations.			
	Solve problems using rational equations.			
	Use direct and inverse variations to solve problems.			

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Scope and Sequence (continued)

Organizing Topic	Essential Knowledge and Skill <i>The student will be able to:</i>	Strategies	Assessment Methods	Resources
Trigonometry	Define and approximate the six trigonometric ratios.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	TI-83 Plus Calculator Activities Modeling a sine function to fit the tidal data for the Bay of Fundy and using it to predict low and high tides Project Build and use a clinometer to measure angles and distances. Video Watch video interview with computer programmer using trigonometry to make video games.
	Give exact trigonometric ratios for special angles.			
	Solve right triangles.			
	Solve problems using trigonometric ratios.			
	Convert between radians and degrees.			
Graph trigonometric functions using amplitude and periods.				
Identities	State and apply the Law of Sines.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	Worksheet Activity Apply knowledge of trigonometry to learn about vectors in physics, and solve problems using vectors.
	State and apply the Law of Cosines.			
	Recognize and apply trigonometric identities.			
Inverse Functions	Demonstrate an understanding of an inverse relation.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	Optional Activity Find the inverse of a matrix using the TI-83 Plus, and use the inverse to solve systems of equations. Video Watch video interview with banker demonstrating how compound interest is used in investing money.
	Evaluate and graph inverse trigonometric functions.			
	Convert between exponential and logarithmic notation.			
	State and apply the laws of logarithms.			
	Distinguish common and natural logarithms.			
	Apply logarithms to solve exponential equations.			
Use exponential equations and logarithms to solve problems.				

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Scope and Sequence (continued)

Organizing Topic	Essential Knowledge and Skill <i>The student will be able to:</i>	Strategies	Assessment Methods	Resources
Probability and Statistics	Count outcomes using combinations and permutations.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	Microsoft Excel Activity Using data for the National Highway Traffic Safety Administration comparing driver's ages to crash data to study the statistics and probabilities used by insurance companies
	Use the binomial theorem to expand binomials.			
	Compute probabilities of simple, mutually exclusive, and independent events.			
	Compute the mean, median, mode, range, and standard deviation.			
	Apply the standard normal distribution to interpret test scores.			
Analytic Geometry	Use <i>conical surfaces</i> to define the four conic sections.	Lecture Question/Answer Demonstration PowerPoint® slides Homework	Quizzes Tests Questioning strategies Facilitator observations	
	Define each conic section as a locus of points.			
	State the equations of the four conics in standard position.			
	Graph and translate each type of conic section			
	Find related points and lines: vertices, centers, foci, directrices, axes, and asymptotes.			
Find the equation of conics from given information.				