

Correlation Between the College Board Standards for College Success and Glencoe's *Algebra 2* © 2010

Number	College Board Performance Expectation	Student Edition Lesson(s)
Standard AII.1 Polynomial Expressions, Functions, and Equations		
Objective AII.1.1		
AII.1.1.1	Adds, subtracts, and multiplies polynomial expressions to solve problems.	6-1, Extend 6-1
AII.1.1.2	Analyzes and describes graphs of polynomial functions by examining their intercepts, zeros, domain and range, and local (turning points) and global (end) behavior.	6-3, 6-4
AII.1.1.3	Uses factoring, properties of exponents, and knowledge of the related contextual needs to transform expressions and solve problems.	5-3, 6-1, 6-2, 6-5
AII.1.1.4	Applies the composition of functions to model and solve problems, explaining the results.	7-1
Objective AII.1.2		
AII.1.2.1	Identifies, interprets, and translates among different representations of quadratic functions, realizing that their graphs are parabolas.	5-1, 5-2, Extend 5-2, 5-7, Explore 5-7
AII.1.2.2	Determines reasonable domain and range values for quadratic functions within a context, and tests the reasonableness of solutions to quadratic equations (zeros of quadratic functions).	5-1
AII.1.2.3	Identifies any points of intersection of the graph of a quadratic equation of the form $y = ax^2$ and the graph of a line of the form $y = k$, and relates the points of intersection to the solutions of the quadratic equation $ax^2 = k$.	Extend 5-2, 10-7
AII.1.2.4	Sketches a quadratic function's graph, and recognizes the relationships between the coefficients of a quadratic function and characteristics of its graph (e.g., shape, position, intercepts, zeros, maximum, minimum, symmetry, vertex).	5-1, 5-2, 5-7
AII.1.2.5	Formulates equations and inequalities based on quadratic functions, solves them using factoring, completing the square, and technology, and interprets their solutions in terms of the original problem context.	Extend 5-2, 5-3, 5-5, Extend 5-5
AII.1.2.6	Develops the quadratic formula, and applies it to the solution of quadratic equations and the interpretation of the nature of their roots.	5-6
AII.1.2.7	Constructs and solves quadratic inequalities in one and two variables, and represents their solutions graphically.	5-8
Objective AII.1.3		
AII.1.3.1	Defines, plots, and computes with complex numbers.	5-4
AII.1.3.2	Describes how the associative, commutative, and distributive properties of operations on real numbers extend to operations on complex numbers.	5-4
AII.1.3.3	Solves quadratic equations with real coefficients over the set of complex numbers.	5-5, 5-6
Standard AII.2 Exponential, Logarithmic, and Other Functions		
Objective AII.2.1		

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AII.2.1.1	Extends the properties of rational exponents to real exponents, relating expressions with rational exponents to the corresponding radical expressions.	7-6
AII.2.1.2	Recognizes exponential functions from their verbal description and tabular, graphical, or symbolic representations, and translates among these representations.	8-1
AII.2.1.3	Describes the effects of changes in the coefficient, base, and exponent on the growth described by an exponential function.	8-1, 8-8
AII.2.1.4	Approximates solutions to an exponential equation, and relates the solutions to the points of intersection of the graph of the exponential equation and the graph of a horizontal line.	Explore 8-2
AII.2.1.5	Analyzes a problem situation modeled by an exponential function, formulates an equation or inequality, and solves the problem.	8-1, 8-2, 8-7, 8-8
AII.2.1.6	Uses exponential functions to solve problems involving compound interest and exponential growth and decay in mathematics and real-world contexts.	8-2, 8-7, 8-8, Explore 8-8
AII.2.1.7	Graphs and analyzes the behavior of exponential functions.	8-1
Objective AII.2.2		
AII.2.2.1	Defines a logarithm as a solution to an exponential equation, and recognizes the inverse relationship between functions defined by logarithms and exponential expressions, showing this relationship graphically.	8-3
AII.2.2.2	Solves problems by applying properties of logarithms [$\log xy = \log x + \log y$, $\log \left(\frac{x}{y}\right) = \log x - \log y$, and $\log(x^a) = a \log(x)$] to construct equivalent forms of a logarithmic expression.	8-5
AII.2.2.3	Applies the inverse relationship between exponential and logarithmic functions to solve problems in mathematics and real-world contexts.	8-7, 8-8
Objective AII.2.3		
AII.2.3.1	Models and solves problems using <u>direct</u> , <u>inverse</u> , <u>joint</u> , and <u>combined variation</u> .	Extend 2-4, 9-5
AII.2.3.2	Models problem situations by constructing equations and inequalities based on rational functions, uses a variety of methods to solve them, and interprets the solutions in terms of the problem situation.	9-4, 9-6, Extend 9-6
AII.2.3.3	Adds, subtracts, multiplies, and evaluates rational functions and simplifies rational expressions with linear and quadratic denominators.	9-1, 9-2, 9-3, 9-4
AII.2.3.4	Describes the graphs of rational functions, describes limitations on the domains and ranges, and examines asymptotic behavior.	9-3, 9-4, Extend 9-4
AII.2.3.5	Uses properties of radicals to solve equations and identifies extraneous roots when they occur.	7-7
Objective AII.2.4		
AII.2.4.1	Analyzes a problem situation to determine or interpret reasonable domain and range values for piecewise-defined functions representing the situation.	2-6
AII.2.4.2	Interprets, constructs, and applies step functions (e.g., greatest integer/floor) and other piecewise-defined functions, including absolute value functions, to model and solve problems.	2-6

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AII.2.4.3	Translates among verbal, graphical, tabular, and symbolic representations of step functions and other piecewise-defined functions, including absolute value functions.	2-6
Standard AII.3		
Objective AII.3.1		
AII.3.1.1	Constructs a system of linear inequalities in two variables to represent a mathematical or real-world setting.	3-3
AII.3.1.2	Analyzes and explains the reasoning used to solve systems of linear equations in two variables.	3-1, 3-2
AII.3.1.3	Solves a system of linear equations in two variables using symbolic methods and graphically, and interprets the meaning of the solution.	3-1, 3-2
Objective AII.3.2		
AII.3.2.1	Represents numerical or relational data categorized by two variables in a matrix and labels the rows and columns. Interprets the meaning of a particular entry in a matrix in terms of the labels of its row and column.	4-1, Extend 4-1
AII.3.2.2	Uses matrix row and column sums to analyze data.	Extend 4-1, 4-2
AII.3.2.3	Develops the properties of matrix addition, and adds and subtracts matrices to solve problems.	4-2
Objective AII.3.3		
AII.3.3.1	Verifies the properties of matrix multiplication, and multiplies matrices to solve problems.	4-3
AII.3.3.2	Constructs a system of linear equations modeling a real-world situation, and represents the system as a matrix equation ($A\mathbf{x} = \mathbf{b}$), that is, $ax + by = c \Leftrightarrow \begin{bmatrix} a & b \\ d & e \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} c \\ f \end{bmatrix}$ $dx + ey = f$	4-6
AII.3.3.3	Solves a system consisting of two or three linear equations in two or three unknowns, respectively, by solving the related matrix equation $A\mathbf{x} = \mathbf{b}$, using technology to find $\mathbf{x} = A^{-1}\mathbf{b}$.	4-6
Standard AII.4		
Objective AII.4.1		
AII.4.1.1	Describes how well-designed experiments use random assignment to balance the variation of some <u>factors</u> in order to isolate the effects of a <u>treatment</u> .	12-1, 12-7
AII.4.1.2	Designs a simple comparative experiment to answer a question: determines treatments, identifies methods of measuring variables, randomly assigns units to treatments, and collects data, distinguishing between explanatory and response variables.	12-7
AII.4.1.3	Organizes and displays data from an experiment; summarizes the data using measures of center and spread, including the mean and <u>standard deviation</u> ; identifies patterns and trends in tables and plots; and communicates methods used and the results of the experimental study to nontechnical persons.	12-2
Objective AII.4.2		

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AII.4.2.1	Distinguishes among questions best explored through a sample survey, an observational study, or a designed experiment. Recognizes that an observed association between a response variable and an explanatory variable does not necessarily imply that the two variables are causally linked. Illustrates the different types of conclusions that may be drawn from surveys, observational studies, and designed experiments.	12-1
AII.4.2.2	Evaluates possible factors involved in a given problem and what information they provide relative to the question of interest. Formulates specific questions and identifies quantitative measures that may be used in providing answers to the question of interest.	12-1
AII.4.2.3	Describes advantages and disadvantages of using different methods of measuring variables. Explains how biases can occur in studies and their effects on study outcomes.	12-1, 12-2
AII.4.2.4	Compares and contrasts the random sampling of units from a population and the random assignment of treatments to experimental units.	12-1
AII.4.2.5	Explains why most research questions do not have unique answers and why several approaches to answering the same question may be appropriate; explains why different studies of the same research question, conducted differently, may yield very different results and why this is to be expected.	12-1
AII.4.2.6	Communicates, both orally and in writing, the purposes, methods, and results of a statistical study using nontechnical language.	12-1, 12-2
AII.4.2.7	Evaluates study results reported in the media.	Extend 12-1
Standard AII.5		
Objective AII.5.1		
AII.5.1.1	Uses permutations, combinations, and the <u>multiplication rule for counting</u> to solve counting and probability problems.	0-4, 0-5, 12-3, 12-4
AII.5.1.2	Recognizes a binomial probability setting, and develops and graphs the probability distribution for a binomial count.	12-7
Objective AII.5.2		
AII.5.2.1	Identifies settings in which the normal distribution may be useful, and describes characteristics of the normal distribution.	12-5
AII.5.2.2	Uses graphical displays and the empirical rule to evaluate the appropriateness of the normal model for a given set of data. Uses the empirical rule to estimate the probability that an event will occur in a specific interval that can be described in terms of whole numbers of standard deviations about the mean.	12-5, Extend 12-5