

**Correlation Between the Achieve ADP Algebra II End-of-Course Exam  
Content Standards and Glencoe's *Algebra 2* © 2010**

Number	Content Standard	Student Edition Lesson(s)
<b>CORE: Operations on Numbers and Exercises</b>		
<b>O1. Real Numbers</b>		
O1.a	Convert between and among radical and exponential forms of numerical expressions.	7-6
O1.b	Simplify and perform operations on numerical expressions containing radicals.	7-5, Concepts and Skills 2
O1.c	Apply the laws of exponents to numerical expressions with rational and negative exponents to order and rewrite them in alternative forms.	6-1, 7-6
<b>O2. Complex Numbers</b>		
O2.a	Represent complex numbers in the form $a + bi$ , where $a$ and $b$ are real; simplify powers of pure imaginary numbers.	5-4
O2.b	Perform operations on the set of complex numbers.	5-4
<b>O3. Algebraic Expressions</b>		
O3.a	Convert between and among radical and exponential forms of algebraic expressions.	7-6
O3.b	Simplify and perform operations on radical algebraic expressions.	7-5
O3.c	Apply the laws of exponents to algebraic expressions, including those involving rational and negative exponents, to order and rewrite them in alternative forms.	6-1, 7-6
O3.d	Perform operations on polynomial expressions.	6-1, Extend 6-1, 6-2
O3.e	Perform operations on rational expressions, including complex fractions.	9-1, 9-2
O3.f	Identify or write equivalent algebraic expressions in one or more variables to extract information.	1-1, 1-2, 6-1, 6-2, 8-3, 8-5, 8-6, 8-7, 9-1
<b>CORE: Equations and Inequalities</b>		
<b>E1. Linear Equations and Inequalities</b>		
E1.a	Solve equations and inequalities involving the absolute value of a linear expression.	1-4, 1-6
E1.b	Express and solve systems of linear equations in three variables with and without the use of technology.	3-5
E1.c	Solve systems of linear inequalities in two variables and graph the solution set.	3-3, Extend 3-3
E1.d	Recognize and solve problems that can be represented by single variable linear equations or inequalities or systems of linear equations or inequalities involving two or more variables. Interpret the solution(s) in terms of the context of the problem.	1-3, 1-5, 2-2, 2-4, Extend 2-4, 2-5, Extend 2-5, 2-6, 2-8, 3-1, 3-2, 3-3, Extend 3-3, 3-4
<b>E2. Nonlinear Equations and Inequalities</b>		

Number	Content Standard	Student Edition Lesson(s)
E2.a	Solve single-variable quadratic, exponential, rational, radical, and factorable higher-order polynomial equations over the set of real numbers, including quadratic equations involving absolute value.	1-4, 5-2, Extend 5-2, 5-3, 5-5, Extend 5-5, 5-6, 6-5, 7-7, Extend 7-7, 8-2, 9-6, Extend 9-6
E2.b	Solve single variable quadratic equations and inequalities over the complex numbers; graph real solution sets on a number line.	5-2, Extend 5-2, 5-3, 5-4, 5-5, Extend 5-5, 5-6, 5-8
E2.c	Use the discriminant, $D = b^2 - 4ac$ , to determine the nature of the solutions of the equation $ax^2 + bx + c = 0$ .	5-6
E2.d	Graph the solution set of a two-variable quadratic inequality in the coordinate plane.	5-8
E2.e	Rewrite nonlinear equations and inequalities to express them in multiple forms in order to facilitate finding a solution set or to extract information about the relationships or graphs indicated.	5-2, 5-3, 5-5, 5-6, 6-5, 7-7, 8-2, 8-4, 9-5, 9-6
<b>CORE: Polynomial and Rational Functions</b>		
<b>P1. Quadratic Functions</b>		
P1.a	Determine key characteristics of quadratic functions and their graphs.	5-1, 5-2
P1.b	Represent quadratic functions using tables, graphs, verbal statements, and equations. Translate among these representations.	5-1, 5-2
P1.c	Describe the effect that changes in the parameters of a quadratic function have on the shape and position of its graph.	Explore 5-7, 5-7
P1.d	Recognize, express, and solve problems that can be modeled using quadratic functions. Interpret their solutions in terms of the context.	5-1, 5-2, 5-3, 5-5, 5-6, 5-7
<b>P2. Higher-Order Polynomial and Rational Functions</b>		
P2.a	Determine key characteristics of power functions in the form $f(x) = ax^n$ , $a \neq 0$ , for positive integral values of $n$ and their graphs.	6-3
P2.b	Determine key characteristics of polynomial functions and their graphs.	6-3, 6-4
P2.c	Represent polynomial functions using tables, graphs, verbal statements, and equations. Translate among these representations.	5-1, 5-2, 6-3, 6-4, 6-5
P2.d	Determine key characteristics of simple rational functions and their graphs.	9-3, 9-4, Extend 9-4
P2.e	Represent simple rational functions using tables, graphs, verbal statements, and equations. Translate among these representations.	9-3, 9-4, Extend 9-4
P2.f	Recognize, express, and solve problems that can be modeled using polynomial and simple rational functions. Interpret their solutions in terms of the context.	6-3, 6-5, 9-3, 9-4, 9-6
<b>CORE: Exponential Functions</b>		
<b>X1. Exponential Functions</b>		
X1.a	Determine key characteristics of exponential functions and their graphs.	8-1
X1.b	Represent exponential functions using tables, graphs, verbal statements, and equations. Represent exponential expressions in multiple forms. Translate among these representations.	8-1, 8-2
X1.c	Describe the effect that changes in a parameter of an exponential function have on the shape and position of its graph.	8-1

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X1.d	Recognize, express, and solve problems that can be modeled using exponential functions, including those where logarithms provide an efficient method of solution. Interpret their solutions in terms of the context.	8-1, 8-3, 8-8
<b>CORE: Function Operations and Inverses</b>		
<b>F1. Function Operations</b>		
F1.a	Combine functions by addition, subtraction, multiplication, and division.	7-1
F1.b	Determine the composition of two functions, including any necessary restrictions on the domain.	7-1
<b>F2. Inverse Functions</b>		
F2.a	Describe the conditions under which an inverse relation is a function.	7-2
F2.b	Determine and graph the inverse relation of a function.	7-2
<b>F3. Piecewise-defined Functions</b>		
F3.a	Determine key characteristics of absolute value, step, and other piecewise-defined functions.	2-6, 2-7
F3.b	Represent piecewise-defined functions using tables, graphs, verbal statements, and equations. Translate among these representations.	2-6, 2-7
F3.c	Recognize, express, and solve problems that can be modeled using absolute value, step, and other piecewise-defined functions. Interpret their solutions in terms of the context.	2-6, 2-7
<b>Module 1: Data and Statistics</b>		
<b>S1. Summarization and Comparison of Data Sets</b>		
S1.a	Summarize and compare data sets using statistical methods.	2-5, Extend 5-1, Extend 6-4, Extend 8-3, 12-2, 12-4, 12-5, Concepts and Skills 8
S1.b	Determine, use, and identify potential misuses of weighted averages.	12-2
S1.c	Use a computer or calculator to find a linear regression equation (least squares line) as a model for data that suggest a linear trend, and determine the correlation coefficient.	2-5, Extend 8-3
<b>S2. Interpretation and Communication Through Data</b>		
S2.a	Analyze the strength of the linear relationship indicated by the regression line.	2-5, Extend 8-3
S2.b	Interpret data and communicate conclusions effectively.	12-2
S2.c	Make judgments regarding accuracy, reasonableness, and bias in the use of data.	12-1, Extend 12-1
S2.d	Critique and justify various methods of sampling and data collection used in real world problems.	12-1
<b>Module 2: Probability</b>		
<b>R1. Permutations, Combinations, and Probability</b>		
R1.a	Determine the number of ways events can occur using permutations, combinations, and other systematic counting methods.	0-4, 0-5, Extend 11-6
R1.b	Relate the expansion of $(x + y)^n$ (i.e., the binomial theorem) with the possible outcomes of a binomial experiment and/or the $n$ th row of Pascal's triangle.	11-6, Extend 11-6, 12-7

Number	Content Standard	Student Edition Lesson(s)
R1.c	Apply probability concepts to calculate the probability of events and to make informed decisions in practical situations.	12-3, 12-4
R1.d	Analyze and interpret actual data to estimate probabilities and predict outcomes, including those involving relative frequency.	12-4, 12-5, 12-6
R1.e	Compare theoretical probabilities with the results of simple experiments (e.g., tossing number cubes, flipping coins, spinning spinners).	12-6, Explore 12-7
R1.f	Compute and graph cumulative frequencies.	Concepts and Skills 6
<b>R2. Probability Distributions</b>		
R2.a	Identify and distinguish between discrete and continuous probability distributions.	12-4, 12-5, 12-7
R2.b	Identify the principal characteristics of the normal distribution and use them to estimate probabilities.	12-5
R2.c	Identify and describe the key characteristics of and create frequency distributions of both discrete and continuous data.	12-4, 12-5, 12-7
<b>Module 3: Logarithmic Functions</b>		
<b>L1. Logarithmic Expressions and Equations</b>		
L1.a	Apply the properties of logarithms and use them to manipulate logarithmic expressions.	8-3, 8-5, 8-6, 8-7
L1.b	Solve logarithmic equations, paying attention to the possibility of extraneous roots.	8-4, Extend 8-6, 8-8
<b>L2. Logarithmic Functions</b>		
L2.a	Determine key characteristics of logarithmic functions.	8-3, 8-8
L2.b	Represent logarithmic functions using tables, graphs, verbal statements, and equations. Translate among these representations.	8-3
L2.c	Describe the effect that changes in the parameters of a logarithmic function have on the shape and position of its graph.	8-3
L2.d	Recognize, express, and solve problems that can be modeled using logarithmic functions. Interpret their solutions in terms of the context of the problem.	8-3, 8-4, 8-8, Extend 8-8
<b>Module 4: Trigonometric Functions</b>		
<b>T1. Trigonometric Functions</b>		
T1.a	Recognize periodic phenomena and determine key characteristics of such phenomena.	13-6
T1.b	Use the relationship of the sine and cosine functions to a central angle of the unit circle to determine the exact trigonometric ratio of angles on the unit circle. ( $0^\circ$ to $360^\circ$ , $0$ to $2\pi$ )	13-6, 13-7
T1.c	Explain and use both degree and radian measure for angles.	13-2
T1.d	Represent trigonometric functions using tables, graphs, verbal statements, and equations. Translate among these representations.	13-7, Explore 13-8
T1.e	Determine key characteristics of trigonometric functions and their graphs.	13-7, Explore 13-8, 13-8
T1.f	Describe the effect that changes in the parameters of an equation of a trigonometric function in the form, $f(x) = A\sin B(x - C) + D$ (or the similar cosine function) have on the shape and position of its graph.	Explore 13-8, 13-8
T1.g	Recognize, express, and solve problems that can be modeled using trigonometric or other periodic functions.	13-6, 13-7, 13-8
<b>Module 5: Matrices</b>		

Number	Content Standard	Student Edition Lesson(s)
<b>M1. Matrix Arithmetic</b>		
M1.a	Perform addition, subtraction, and scalar multiplication of matrices.	4-2
M1.b	Perform matrix multiplication.	4-3
<b>M2. Solving Systems of Equations Using Matrices</b>		
M2.a	Find the determinant of a $2 \times 2$ or $3 \times 3$ matrix.	4-5
M2.b	Determine the inverse of a $2 \times 2$ or $3 \times 3$ matrix or indicate that no inverse exists.	4-6
M2.c	Represent 2-variable and 3-variable systems of linear equations using matrices and use them to solve the system.	4-5, 4-6, Extend 4-6
M2.d	Solve a matrix equation.	4-6
<b>M3. Matrix Transformations</b>		
M3.a	Use matrix tools to represent and transform geometric objects in the coordinate plane.	4-4
<b>M4. Vectors</b>		
M4.a	Represent vectors as matrices in two dimensions.	Extend 4-4
M4.b	Add, subtract, and compute the dot product of two-dimensional vectors; multiply a two-dimensional vector by a scalar.	Extend 4-4
<b>Module 6: Conic Sections</b>		
<b>C1. Conic Sections</b>		
C1.a	Identify a parabola, circle, ellipse, or hyperbola from its equation, description, or key characteristics.	10-2, Explore 10-3, 10-3, 10-4, 10-5, 10-6
C1.b	Represent conic sections whose axes are parallel to the $x$ - and $y$ -axes using graphs, verbal statements, and equations. Translate among these representations. Represent the equations of conic sections in multiple forms to extract information about the parabola, circle, ellipse, or hyperbola.	10-2, 10-3, 10-4, 10-5, 10-6
C1.c	Describe the effect that changes in the parameters of a particular conic section have on its shape and position.	10-2, 10-3, 10-4, 10-5
C1.d	Recognize, express, and solve problems that can be modeled using conic sections. Interpret their solutions in terms of the context of the problem.	10-2, 10-3, 10-4, 10-5, 10-6
<b>Module 7: Sequences and Series</b>		
<b>II. Arithmetic and Geometric Sequences and Series</b>		
II.a	Represent the general term of an arithmetic or geometric sequence and use it to generate the sequence or determine the value of any particular term.	11-2, 11-3
II.b	Represent partial sums of an arithmetic or geometric sequence and determine the value of a particular partial sum or sum of a finite sequence.	11-2, 11-3
II.c	Recognize when an infinite geometric sum can be determined and determine the sum when possible.	11-4
II.d	Convert the recursive model for linear growth ( $a_1 = a$ , $a_{n+1} = a_n + d$ , where $a$ is the first term and $d$ is the constant difference) to a closed linear form ( $a_n = a + (n - 1)d$ ).	11-5
II.e	Convert the recursive model of geometric growth ( $p_1 = a$ , $p_{n+1} = rp_n$ where $a$ is the first term and $r$ is the constant growth rate) to a closed exponential form ( $p_n = ar^{n-1}$ ).	11-5

Number	Content Standard	Student Edition Lesson(s)
11.f	Recognize, express, and solve problems that can be modeled using a finite geometric series. Interpret their solutions in terms of the context of the problem.	11-3
<b>12. Other Types of Iteration and Recursion</b>		
12.a	Use recursion to generate and describe, analyze, and interpret patterned relationships other than arithmetic or geometric sequences.	11-5
12.b	Use iterative methods to solve problems.	11-5