Common Core State Standards, Traditional Algebra II Pathway, Correlated to *Glencoe Algebra 2,* Common Core Edition

Lessons in which the standard is the primary focus are indicated in **bold**.

Standards	Student Edition Lesson(s)	Student Edition Page(s)
Number and Quantity		
The Complex Number System N-CN		
Perform arithmetic operations with complex numbers. 1. Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.	**4-4**	**246–252**
2. Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	**4-4**	**246–252**
Use complex numbers in polynomial identities and equations. 7. Solve quadratic equations with real coefficients that have complex solutions.	**4-5,** Extend 4-5, **4-6**	**256–262,** 263, **264–272**
8. (+) Extend polynomial identities to the complex numbers.	4-4, **4-6**	246–252, **264–272**
9. (+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	**5-7**	**358–365**
Algebra		
Seeing Structure in Expressions A-SSE		
Interpret the structure of expressions. 1. Interpret expressions that represent a quantity in terms of its context. ★ a. Interpret parts of an expression, such as terms, factors, and coefficients.	1-1, **4-1**	5–10, **219–227**
b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	1-1, 1-4, 2-2, 2-4, **2-6,** 2-7, 4-1, **4-6,** 4-7, 5-4, 9-2, 9-3, 9-4, 9-5, **9-6,** 10-7	5–10, 27–32, 69–74, 83–89, **101–107,** 109–116, 219–227, **264–272,** 275–280, 330–337, 599–605, 607–613, 615–622, 624–631, **632–636,** 705–709

(+) Advanced Mathematics Standards ★ Mathematical Modeling Standards

Standards	Student Edition Lesson(s)	Student Edition Page(s)
2. Use the structure of an expression to identify ways to rewrite it.	1-2, 4-3, **4-5,** 6-4, **6-5,** 7-2, 7-3, 7-4, 7-7, 7-8	11–17, 238–245, **256–262,** 407–411, **415–421,** 461–467, 468–475, 478–483, 501–507, 509–515
Write expressions in equivalent forms to solve problems. 4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. ★	**10-3**	**674–680**
Arithmetic with Polynomials and Rational Expressions A-APR		
Perform arithmetic operations on polynomials. 1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	4-3, **5-1**	238–245, **303–309**
Understand the relationship between zeros and factors of polynomials. 2. Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.	**5-6**	**352–357**
3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	**5-7**	**358–365**
Use polynomial identities to solve problems. 4. Prove polynomial identities and use them to describe numerical relationships.	**4-3,** 4-5, **4-6,** Extend 5-7	**238–245,** 256–262, **264–272,** 366
5. (+) Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.	**10-6,** Extend 10-6, 10-7, **11-4**	**699–703,** 704, 705–709, **752–759**
Rewrite rational expressions. 6. Rewrite simple rational expressions in different forms; write $\frac{a(x)}{b(x)}$ in the form $q(x) + \frac{r(x)}{b(x)}$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.	**5-2, Extend 5-2**	**311–317, 318–319**
7. (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	**8-1, 8-2,** 8-4, 8-6	**529–537, 538–544,** 553–560, 570–578

Common Core State Standards *Continued*

Standards	Student Edition Lesson(s)	Student Edition Page(s)
Creating Equations★ A-CED		
Create equations that describe numbers or relationships. 1. Create equations and inequalities in one variable and use them to solve problems.	1-3, 1-4, 1-5, 1-6, 4-3, 4-5, 4-6, 4-8, 5-5, 5-6, 5-7, 7-2, 7-4, 7-5, 7-6, 7-8, 8-6	18–25, 27–32, 33–39, 41–48, 238–245, 256–262, 264–272, 282–288, 342–349, 352–357, 358–365, 461–467, 478–483, 485–491, 492–498, 508–515, 570–578
2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	Throughout the text; for example, 2-4, 3-1, 4-2, 6-3, 9-3, 12-7	Throughout the text; for example, 83–89, 136–145, 229–236, 400–406, 607–613, 837–843
3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.	1-4, 1-5, 1-6, 2-6, 2-7, 2-8, **3-1,** 3-2, **3-3,** 3-4, 3-7, 3-8, 4-8, 7-8, 8-6	27–32, 33–39, 41–48, 101–107, 109–116, **117–121,** 136–145, **146–152,** 154–160, 189–197, 198–204, 282–288, 509–515, 570–578
4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	**4-6,** 9-1, 9-3, 10-2	**264–272,** 593–598, 607–613, 666–673
Reasoning with Equations and Inequalities A-REI		
Understand solving equations as a process of reasoning and explain the reasoning. 2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	**6-7, Extend 6-7, 8-6, Extend 8-6**	**429–435, 436–437, 570–578, 579–580**
Represent and solve equations and inequalities graphically. 11. Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. ★	**3-1,** Extend 4-2, Extend 5-5, Extend 6-7, Explore 7-2, Extend 7-6, Extend 8-6, **9-7**	**136–145,** 237, 350–351, 436–437, 459–460, 499–500, 579–580, **640–645**
Functions		
Interpreting Functions F-IF		
Interpret functions that arise in applications in terms of the context. 4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. ★	Throughout the text; for example, 2-1, Extend 2-1, Extend 2-2, 2-6, 5-3, 8-4, 10-1, 12-6	Throughout the text; for example, 61–67, 68, 75, 101–107, 322–329, 553–560, 659–665, 830–836

(+) Advanced Mathematics Standards ★ Mathematical Modeling Standards

Standards	Student Edition Lesson(s)	Student Edition Page(s)
5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	**2-1,** 2-6, 4-1, 5-3, 6-2, 6-3, 7-1, 7-3, **8-3,** 8-4, 12-7	**61–67,** 101–107, 219–227, 322–329, 393–398, 400–406, 451–458, 468–475, **545–551,** 553–560, 837–843
6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. ★	**2-3,** Extend 4-7	**76–82,** 281
Analyze functions using different representations. 7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ★ b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	**2-6, 6-3, Extend 6-4**	**101–107, 400–406, 413**
c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.	5-3, **5-4,** Extend 5-4, 5-6, **5-7**	322–329, **330–337,** 338–339, 352–357, **358–365**
e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	**7-1, 7-3, 12-7, 12-8**	**451–458, 468–475, 837–843, 845–852**
8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	**4-3, 4-5,** 4-7	**238–245, 256–262,** 275–280
b. Use the properties of exponents to interpret expressions for exponential functions.	**7-1, 7-8**	**451–458, 509–515**
9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	**2-2, 2-7,** 4-1, 5-3, 6-1, 6-3, 7-1, 8-4, 9-6	**69–74, 109–116,** 219–227, 322–329, 385–392, 400–406, 451–458, 553–560, 632–636
Building Functions F-BF		
1. Build a function that models a relationship between two quantities. b. Combine standard function types using arithmetic operations.	**6-1,** Extend 7-8, 12-8	**385–392,** 516, 845–852
Build new functions from existing functions. 3. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology.	Explore 2-7, **2-7,** Explore 4-7, **4-7, 6-3,** Extend 6-4, **7-1, 7-3, 8-3,** Explore 12-8, **12-8**	108, **109–116,** 273–274, **275–280, 400–406,** 416, **451–458, 468–475, 545–551,** 844, **845–852**

Common Core State Standards *Continued*

Standards	Student Edition Lesson(s)	Student Edition Page(s)
4. Find inverse functions. a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse.	**6-2**	**393–398**
Linear, Quadratic, and Exponential Models F-LE		
Construct and compare linear and exponential models and solve problems. 4. For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.	**7-2, 7-8**	**461–467, 509–515**
Trigonometric Functions F-TF		
Extend the domain of trigonometric functions using the unit circle. 1. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	**12-2, 12-6**	**799–805, 830–836**
2. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	**12-6**	**830–836**
Model periodic phenomena with trigonometric functions. 5. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline. ★	**12-7, 12-8**	**837–843, 845–852**
Prove and apply trigonometric identities. 8. Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to calculate trigonometric ratios.	**13-1,** 13-2, 13-3, 13-4, 13-5	**873–879,** 880–885, 886–891, 893–899, 901–907
Statistics and Probability		
Interpreting Categorical and Quantitative Data S-ID		
Summarize, represent, and interpret data on a single count or measurement variable. 4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.	**11-5, Extend 11-5**	**760–766, 767–768**

(+) Advanced Mathematics Standards ★ Mathematical Modeling Standards

Standards	Student Edition Lesson(s)	Student Edition Page(s)
Making Inferences and Justifying Conclusions S-IC		
Understand and evaluate random processes underlying statistical experiments 1. Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	**11-2, 11-6**	**733–741, 769–776**
2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.	**11-1, Extend 11-1**	**723–730, 731–732**
Make inferences and justify conclusions from sample surveys, experiments, and observational studies 3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	**11-1**	**723–730**
4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.	**Extend 11-1, 11-6**	**731–732, 769–775**
5. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.	**11-1**	**723–730**
6. Evaluate reports based on data.	**Extend 11-1**	**731–732**
Using Probability to Make Decisions S-MD		
6. (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).	11-4	752–759
7. (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	11-3, 11-4, 11-6	742–750, 752–759, 769–776

Common Core State Standards for Mathematical Practice, Correlated to *Glencoe Algebra 2*, Common Core Edition

1. Make sense of problems and persevere in solving them. *Glencoe Algebra 2* exhibits these practices throughout the entire program. Some specific lessons for review are: Lessons 1-1, 2-1, 3-2, 4-1, 5-3, 6-5, 7-8, 8-5, 9-2, 10-7, 11-2, 12-7, and 13-2.
2. Reason abstractly and quantitatively. *Glencoe Algebra 2* exhibits these practices throughout the entire program. Some specific lessons for review are: Lessons 1-2, 2-5, 3-1, 4-3, 5-1, 6-1, 7-2, 8-1, 9-1, 10-1, 11-3, 12-2, and 13-1.
3. Construct viable arguments and critique the reasoning of others. *Glencoe Algebra 2* exhibits these practices throughout the entire program. Some specific lessons for review are: Lessons 1-3, 2-2, 3-4, 4-2, 5-4, 6-3, 7-1, 8-2, 9-6, 10-7, 11-1, 12-4, and 13-3.
4. Model with mathematics. *Glencoe Algebra 2* exhibits these practices throughout the entire program. Some specific lessons for review are: Lessons 1-5, 2-5, 3-3, Extend 4-8, 5-5, 6-7, Extend 7-3, 8-5, 9-6, 10-6, 11-4, 12-8, and 13-5.
5. Use appropriate tools strategically. *Glencoe Algebra 2* exhibits these practices throughout the entire program. Some specific lessons for review are: Lessons 1-6, 2-5, 3-8, Extend 4-1, Extend 5-4, Extend 6-4, Explore 7-8, Extend 8-6, Explore 9-4, Extend 10-5, Extend 11-1, Explore 12-8, and Explore 13-5.
6. Attend to precision. *Glencoe Algebra 2* exhibits these practices throughout the entire program. Some specific lessons for review are: Lessons 1-3, 2-5, 3-1, Extend 4-1, Extend 5-1, 6-4, 7-8, 8-6, 9-5, 10-4, 11-5, 12-3, and 13-5.
7. Look for and make use of structure. *Glencoe Algebra 2* exhibits these practices throughout the entire program. Some specific lessons for review are: Lessons 1-2, 2-1, 3-7, 4-7, 5-6, 6-2, 7-7, 8-4, 9-6, 10-1, 11-2, 12-6, and 13-2.
8. Look for and express regularity in repeated reasoning. *Glencoe Algebra 2* exhibits these practices throughout the entire program. Some specific lessons for review are: Lessons 1-3, 2-7, 3-1, 4-6, 5-8, 6-2, 7-5, 8-1, 9-6, 10-7, 11-5, Explore 12-1, and 13-2.