



Algebra 2

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STANDARDS		PAGE REFERENCES
Learning Standards for Algebra II		
Number Sense and Operations		
Understand numbers, ways of representing numbers, relationships among numbers, and number systems		
Understand meanings of operations and how they relate to one another		
Compute fluently and make reasonable estimates		
<i>Students engage in problem solving, communicating, reasoning, connecting, and representing as they:</i>		
All.N.1	Define complex numbers (e.g., $a + bi$) and operations on them, in particular, addition, subtraction, multiplication, and division. Relate the system of complex numbers to the systems of real and rational numbers. (12.N.1)	Student Edition: 270-275, 280 #67-#75, 281 #29-#30, 293 #64-#66, 299 #60-#62, 315 Example 4 <i>Extra Practice Lesson 5-9 839</i> Teacher Wraparound Edition: A 275; AA 272; DI 271
All.N.2	Simplify numerical expressions with powers and roots, including fractional and negative exponents. (12.N.2)	Student Edition: 222-228, 245-249, 250-256, 257-262, 277 #11-#14, 279 #43-#57 Teacher Wraparound Edition: CC 224; DI 223, 225, 226

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<p>Patterns, Relations, and Algebra</p> <p>Understand patterns, relations, and functions</p> <p>Represent and analyze mathematical situations and structures using algebraic symbols</p> <p>Use mathematical models to represent and understand quantitative relationships</p> <p>Analyze change in various contexts</p> <hr/> <p><i>Students engage in problem solving, communicating, reasoning, connecting, and representing as they:</i></p>		
A11.P.1	Describe, complete, extend, analyze, generalize, and create a wide variety of patterns, including iterative and recursive patterns such as Pascal's Triangle. (12.P.1)	<p>Student Edition: 606-610, 617 #46-#47, 621 #38-#39, 625 #36-#43, 627 #16-#18</p> <p><i>Algebra Activity</i> 611</p> <p>Teacher Wraparound Edition: A 610; AA 607; DI 608; H 606</p>
A11.P.2	Identify arithmetic and geometric sequences and finite arithmetic and geometric series. Use the properties of such sequences and series to solve problems, including finding the formula for the general term and the sum, recursively and explicitly. (12.P.2)	<p>Student Edition: 578-582, 583-587, 588-592, 594-598, 599-604, 623 #9-#16</p> <p><i>Graphing Calculator Investigation</i> 593</p> <p>Teacher Wraparound Edition: A 582, 592, 598</p>
A11.P.3	Demonstrate an understanding of the binomial theorem and use it in the solution of problems. (12.P.3)	<p>Student Edition: 612-617, 621 #35-#37, 626 #44-#48, 627 #19-#20, 637 #35-#36</p> <p>Teacher Wraparound Edition: A 617; DI 615; H 612; TT 613</p>
A11.P.4	Demonstrate an understanding of the exponential and logarithmic functions.	<p>Student Edition: 523-530, 531-538, 567 #12-#13, 571 #30</p> <p><i>Graphing Calculator Investigation</i> 552-553</p> <p>Teacher Wraparound Edition: A 530, 538; DI 534; GCI 524; TT 532</p>
A11.P.5	Perform operations on functions, including composition. Find inverses of functions. (12.P.5)	<p>Student Edition: 383-389, 390-394, 399 #40-#45, 403 #42-#47, 404 #48-#53</p> <p>Teacher Wraparound Edition: A 389, 394; DI 385, 386; TNT 384</p>
A11.P.6	Given algebraic, numeric and/or graphical representations, recognize functions as polynomial, rational, logarithmic, or exponential. (12.P.6)	<p>Student Edition: 352 #57, 364 #2, 488 #3, 490 #52-#53, 537 #74, 546 #57-#58, 571 #30</p> <p><i>Graphing Calculator Investigation</i> 359, 491, 539-540</p>

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<p>A11.P.7 Find solutions to quadratic equations (with real coefficients and real or complex roots) and apply to the solutions of problems. (12.P.7)</p>	<p>Student Edition: 294-299, 301-305, 306-312, 313-319, 337 #18-#23</p> <p>Teacher Wraparound Edition: A 299, 305, 312, 319; DI 309, 316</p>
<p>A11.P.8 Solve a variety of equations and inequalities using algebraic, graphical, and numerical methods, including the quadratic formula; use technology where appropriate. Include polynomial, exponential, and logarithmic functions; expressions involving the absolute values; and simple rational expressions. (12.P.8)</p>	<p>Student Edition: 313-319, 505-511, 523-530, 531-538, 544 #21-#32, 548 Example 3, 549 #7-#12</p> <p>Teacher Wraparound Edition: A 511; TT 506, 507</p>
<p>A11.P.9 Use matrices to solve systems of linear equations. Apply to the solution of everyday problems. (12.P.9)</p>	<p>Student Edition: 202-207, 214 #45-#48, 215 #13-#15, 228 #66-#67, 232 #62</p> <p><i>Graphing Calculator Investigation</i> 208</p> <p>Teacher Wraparound Edition: A 207; DI 205; GCI 205; GS 208</p>
<p>A11.P.10 Use symbolic, numeric, and graphical methods to solve systems of equations and/or inequalities involving algebraic, exponential, and logarithmic expressions. Also use technology where appropriate. Describe the relationships among the methods. (12.P.10)</p>	<p>Student Edition: 110-115, 116-122, 123-127, 135 #46-#50, 138-144, 146 #15-#20, 149 #4-#9</p> <p><i>Algebra Activity</i> 136-137</p> <p><i>Graphing Calculator Investigation</i> 128, 552-553</p>
<p>A11.P.11 Solve everyday problems that can be modeled using polynomial, rational, exponential, logarithmic, and step functions, absolute values and square roots. Apply appropriate graphical, tabular, or symbolic methods to the solution. Include growth and decay; logistic growth; joint (e.g., $I = Prt$, $y = k(w_1 + w_2)$), and combined ($F = G(m_1m_2)/d^2$) variation. (12.P.11)</p>	<p>Student Edition: 529 #62-#64, 535 #18-#20, 537 #68-#69, 542 Example 3, 560-565, 570 #62-#65, 571 #28-#29, 573 #22-#25</p> <p>Teacher Wraparound Edition: A 565; DI 561</p>
<p>A11.P.12 Identify maximum and minimum values of functions in simple situations. Apply to the solution of problems. (12.P.12)</p>	<p>Student Edition: 288 Example 3, 289 Example 4, 290 #3, 291 #32-#43, 293 #58-#63, 305 #56, 337 #15-#17</p> <p>Teacher Wraparound Edition: A 293; DI 288, 289</p>

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<p>A11.P.13 Describe the translations and scale changes of a given function $f(x)$ resulting from substitutions for the various parameters a, b, c, and d in $y = af(b(x + c/b)) + d$. In particular, describe the effect of such changes on polynomial, rational, exponential, and logarithmic functions. (12.P.13)</p>	<p>Student Edition: <i>Graphing Calculator Investigation</i> 70, 91, 320-321</p> <p>Teacher Wraparound Edition: A 321, 328; DI 324; GCI 70, 91; H 322; T 320; TNT 323</p>
<p>Geometry</p> <p>Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships</p> <p>Specify locations and describe spatial relationships using coordinate geometry and other representational systems</p> <p>Apply transformations and use symmetry to analyze mathematical situations</p> <p>Use visualization, spatial reasoning, and geometric modeling to solve problems</p> <hr/> <p><i>Students engage in problem solving, communicating, reasoning, connecting, and representing as they:</i></p>	
<p>All.G.1 Define the sine, cosine, and tangent of an acute angle. Apply to the solution of problems. (12.G.1)</p>	<p>Student Edition: 701-708, 714 #64-#67, 717-724, 753 #10-#15, 754 #24-#29, 757 #14-#21</p> <p>Teacher Wraparound Edition: A 708, 724; CC 704; DI 704</p>
<p>All.G.2 Derive and apply basic trigonometric identities (e.g., $\sin^2\theta + \cos^2\theta = 1$, $\tan^2\theta + 1 = \sec^2\theta$) and the laws of sines and cosines. (12.G.2)</p>	<p>Student Edition: 777-781, 782-785, 786-790, 791-797, 806 #19-#23, 807 #24-#27</p> <p>Teacher Wraparound Edition: A 781, 784; DI 778; TT 778</p>
<p>All.G.3 Relate geometric and algebraic representations of lines, simple curves, and conic sections. (12.G.4)</p>	<p>Student Edition: 449-452</p> <p><i>Algebra Activity</i> 453-454</p> <p>Teacher Wraparound Edition: A 452; DI 450; H 449; TTT 452</p>

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<p>Data Analysis, Statistics, and Probability</p> <p>Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them</p> <p>Select and use appropriate statistical methods to analyze data</p> <p>Develop and evaluate inferences and predictions that are based on data</p> <p>Understand and apply basic concepts of probability</p> <p>-----</p> <p><i>Students engage in problem solving, communicating, reasoning, connecting, and representing as they:</i></p>	
<p>All.D.1 Select an appropriate graphical representation for a set of data and use appropriate statistics (e.g., quartile or percentile distribution) to communicate information about the data. (12.D.2)</p>	<p>Student Edition: 664-670, 680 #47, 690 #26-#28, 695 #19-#21, 826-827, 873 #11-#13</p> <p>Teacher Wraparound Edition: A 670; TNT 668; W 664</p>
<p>All.D.2 Use combinatorics (e.g., “fundamental counting principle,” permutations, and combinations) to solve problems, in particular, to compute probabilities of compound events. Use technology as appropriate. (12.D.6)</p>	<p>Student Edition: 632-637, 638-643, 650 #70-#74, 657 #57, 687 #8-#12, 693 #7-#12</p> <p>Teacher Wraparound Edition: A 643; DI 634; H 632, 638</p>