



**NEW JERSEY**  
**Core Curriculum Content Standards for Mathematics**  
**Grade 12**  
**Algebra 1 © 2005**

CONTENT STANDARDS	PAGE REFERENCES
<b>Standard 4.1 (Number and Numerical Operations) All students will develop number sense and will perform standard numerical operations and estimations on all types of numbers in a variety of ways.</b>	
Building upon knowledge and skills gained in preceding grades, by the end of <b>Grade 12</b> , students will:	
<b>A. Number Sense</b>	
1. Extend understanding of the number system to all real numbers.	SE: 77 #63, 104-109, 126 #56-#59, 129, 221 #1, 443 Example 2, 624 <i>Extra Practice</i> 825 Lesson 2-7 <i>Study Guide and Review</i> 114 TWE: IE 104-105 TNT 106
2. Compare and order rational and irrational numbers.	SE: 68-72, 74, 105 Example 3, 108 #58-#69, 245 #42 <i>Practice Quiz</i> 83 #1 <i>Study Guide and Review</i> 110 #9-#15 TWE: H 68 IE 69 <i>Skills Practice</i> 78
3. Develop conjectures and informal proofs of properties of number systems and sets of numbers.	SE: 22, 23 #1, 32-33, 34 #1, 81 #3, 128-129, 135, 137, 138 #2
<b>B. Numerical Operations</b>	
1. Extend understanding and use of operations to real numbers and algebraic procedures.	SE: 11-15, 20 #53-#56, 55 #26-#28, 122 Example 3, 142-147, 151 #1 <i>Algebra Activity</i> 122 TWE: DI 129
2. Develop, apply, and explain methods for solving problems involving rational and negative exponents.	SE: 410-411, 417, 419-423, 425-430 <i>Graphing Calculator Investigation</i> 418 TWE: DI 412 IE 412 <i>Reading to Learn Mathematics</i> 459, 465
3. Perform operations on matrices. <ul style="list-style-type: none"> <li>• Addition and subtraction</li> <li>• Scalar multiplication</li> </ul>	SE: 716-721, 728 #30-#33, 736 #39-#41 <i>Study Guide and Review</i> 746 #13-#22 TWE: A 721 DI 720 IE 716-717 <i>Reading to Learn Mathematics</i> 791 <i>Skills Practice</i> 790 <i>Study Guide and Intervention</i> 787

CONTENT STANDARDS	PAGE REFERENCES
4. Understand and apply the laws of exponents to simplify expressions involving numbers raised to powers.	SE: 410-411, 417, 419-423, 425-430 <i>Graphing Calculator Investigation</i> 418 TWE: DI 412 IE 412 <i>Reading to Learn Mathematics</i> 459, 465
<b>C. Estimation</b>	
1. Recognize the limitations of estimation, assess the amount of error resulting from estimation, and determine whether the error is within acceptable tolerance limits.	SE: 17-18 Example 4, 52 Example 3, 147 #51-#52, 535 Example 5 <i>Algebra Activity</i> 49 #3-#4 <i>How</i> 142 TWE: IE 51
<b>Standard 4.2 (Geometry and Measurement) All students will develop spatial sense and the ability to use geometric properties, relationships, and measurement to model, describe and analyze phenomena.</b>	
<b>A. Geometric Properties</b>	
1. Use geometric models to represent real-world situations and objects and to solve problems using those models (e.g., use Pythagorean theorem to decide whether an object can fit through a doorway).	SE: 85 Example 4, 100 #51-#53, 169 #41 <i>Standardized Test Practice</i> 117 #10 <i>What</i> 6 <i>Why</i> 256 <i>Enrichment</i> 110
2. Draw perspective views of 3D objects on isometric dot paper, given 2D representations (e.g., nets or projective views).	SE: 442 #36-#40 <i>Algebra Activity</i> 416
3. Apply the properties of geometric shapes. <ul style="list-style-type: none"> <li>• Parallel lines - transversal, alternate interior angles, corresponding angles</li> <li>• Triangles <ul style="list-style-type: none"> <li>a. Conditions for congruence</li> <li>b. Segment joining midpoints of two sides is parallel to and half the length of the third side</li> <li>c. Triangle inequality</li> </ul> </li> <li>• Minimal conditions for a shape to be a special quadrilateral</li> <li>• Circles - arcs, central and inscribed angles, chords, tangents</li> <li>• Self-similarity</li> </ul>	SE: 292-297, 370 Example 2, 372 #18, #20, 394 Example 2, 616-621 <i>Algebra Activity</i> 293 <i>Study Guide and Review</i> 399 7-1 TWE: DI 294 IE 294, 395 #2 <i>Enrichment</i> 316
4. Use reasoning and some form of proof to verify or refute conjectures and theorems. <ul style="list-style-type: none"> <li>• Verification or refutation of proposed proofs</li> <li>• Simple proofs involving congruent triangles</li> <li>• Counterexamples to incorrect conjectures</li> </ul>	SE: 38-39 Example 3 – Example 5, 210 #49, 330 #52, 371 #3, 414 #55-#57 <i>Algebra Activity</i> 28, 49, 102, 122, 127
<b>B. Transforming Shapes</b>	
1. Determine, describe, and draw the effect of a transformation, or a sequence of transformations, on a geometric or algebraic object, and, conversely, determine whether and how one object can be transformed to another by a transformation or a sequence of transformations.	SE: 197-203, 211 #57-#59, 217 #59, 415 #71-#73 <i>Graphing Calculator Investigation</i> 554 TWE: DI 199 H 197 IE 198-199, 200 <i>Reading to Learn Mathematics</i> 223

CONTENT STANDARDS	PAGE REFERENCES
2. Recognize three-dimensional figures obtained through transformations of two-dimensional figures (e.g., cone as rotating an isosceles triangle about an altitude), using software as an aid to visualization.	This objective can be taught with the following example. SE: 197-203
3. Determine whether two or more given shapes can be used to generate a tessellation.	This objective can be taught with the following example. SE: 245 #31-#33
4. Generate and analyze iterative geometric patterns. <ul style="list-style-type: none"> <li>• Fractals (e.g., Sierpinski's Triangle)</li> <li>• Patterns in areas and perimeters of self-similar figures</li> <li>• Outcome of extending iterative process indefinitely</li> </ul>	SE: 202 #37, 240 Example 1, 570 #16 <i>Algebra Activity</i> 102 #6 TWE: DI 198, 235
<b>C. Coordinate Geometry</b>	
1. Use coordinate geometry to represent and verify properties of lines. <ul style="list-style-type: none"> <li>• Distance between two points</li> <li>• Midpoint and slope of a line segment</li> <li>• Finding the intersection of two lines</li> <li>• Lines with the same slope are parallel</li> <li>• Lines that are perpendicular have slopes whose product is -1</li> </ul>	SE: 196 #48-#50, 256-262, 611-615 <i>Study Guide and Review</i> 311 5-6 TWE: DI 260 IE 257, 258 <i>Enrichment</i> 286 <i>Skills Practice</i> 284
2. Show position and represent motion in the coordinate plane using vectors. <ul style="list-style-type: none"> <li>• Addition and subtraction of vectors</li> </ul>	See Glencoe's <i>Geometry</i> © 2005 SE: 498-502, 503 #14, 504 #54, 505 #58, 511 #51-52, 515, 528 #66-69, 535 #63
<b>D. Units of Measurement</b>	
1. Understand and use the concept of significant digits.	This objective can be taught with the following examples. SE: 330 #49, 349 #13, 492 Example 6, 499 #51 <i>How</i> 731
2. Choose appropriate tools and techniques to achieve the specified degree of precision and error needed in a situation. <ul style="list-style-type: none"> <li>• Degree of accuracy of a given measurement tool</li> <li>• Finding the interval in which a computed measure (e.g., area or volume) lies, given the degree of precision of linear measurements</li> </ul>	SE: <i>Algebra Activity</i> 622, 626
<b>E. Measuring Geometric Objects</b>	
1. Use techniques of indirect measurement to represent and solve problems. <ul style="list-style-type: none"> <li>• Similar triangles</li> <li>• Pythagorean theorem</li> <li>• Right triangle trigonometry (sine, cosine, tangent)</li> </ul>	SE: 618 Example 3, 619 #26-#28, 620 #29-#32, 625, 629 #61-#62 <i>Algebra Activity</i> 626 <i>How</i> 616, 623 TWE: DI 618 H 616 IE 618

CONTENT STANDARDS	PAGE REFERENCES
<p>2. Use a variety of strategies to determine perimeter and area of plane figures and surface area and volume of 3D figures.</p> <ul style="list-style-type: none"> <li>• Approximation of area using grids of different sizes</li> <li>• Finding which shape has minimal (or maximal) area, perimeter, volume, or surface area under given conditions using graphing calculators, dynamic geometric software, and/or spreadsheets</li> <li>• Estimation of area, perimeter, volume, and surface area</li> </ul>	<p>SE: 85 Example 4, 122 Example 3, 124 #23-#26, 126 #52, 147 #49, #54, 153 #47, 412 Example 4, 414 #43-#48  <i>Algebra Activity</i> 626  <i>Practice Quiz</i> 140</p>
<p><b>Standard 4.3 (Patterns and Algebra) All students will represent and analyze relationships among variable quantities and solve problems involving patterns, functions, and algebraic concepts and processes.</b></p>	
<p><b>A. Patterns</b></p>	
<p>1. Use models and algebraic formulas to represent and analyze sequences and series.</p> <ul style="list-style-type: none"> <li>• Explicit formulas for <math>n^{\text{th}}</math> terms</li> <li>• Sums of finite arithmetic series</li> <li>• Sums of finite and infinite geometric series</li> </ul>	<p>SE: 233-238, 242-245, 567-572  <i>Algebra Activity</i> 573  <i>Spreadsheet Investigation</i> 232</p> <p>TWE: A 572  H 232  DI 568  IE 568  <i>Enrichment</i> 254</p>
<p>2. Develop an informal notion of limit.</p>	<p>SE: 237 #47-#49, 238 #54-#55, 245 #34, 571 #60, 572 #66-#67  <i>How</i> 567</p> <p>TWE: A 572</p>
<p>3. Use inductive reasoning to form generalizations.</p>	<p>SE: 234, 235 Example 4, 236 #12-#13, 237 #47, #51, 245 #32  <i>Algebra Activity</i> 241</p> <p>TWE: IE 235 #4a</p>
<p><b>B. Functions and Relationships</b></p>	
<p>1. Understand relations and functions and select, convert flexibly among, and use various representations for them, including equations or inequalities, tables, and graphs.</p>	<p>SE: 45 Example 4, 47 #14-#19, 205-210, 212-217, 218-223, 226-231</p> <p>TWE: DI 219  H 205  IE 214</p>
<p>2. Analyze and explain the general properties and behavior of functions of one variable, using appropriate graphing technologies.</p> <ul style="list-style-type: none"> <li>• Slope of a line or curve</li> <li>• Domain and range</li> <li>• Intercepts</li> <li>• Continuity</li> <li>• Maximum/minimum</li> <li>• Estimating roots of equations</li> <li>• Intersecting points as solutions of systems of equations</li> <li>• Rates of change</li> </ul>	<p>SE: 280-281 Example 1  <i>Algebra Activity</i> 49  <i>Graphing Calculator Investigation</i> 224-225, 265, 278-279, 333, 358, 395, 531  <i>How</i> 149</p>

CONTENT STANDARDS	PAGE REFERENCES
3. Understand and perform transformations on commonly-used functions. <ul style="list-style-type: none"> <li>• Translations, reflections, dilations</li> <li>• Effects on linear and quadratic graphs of parameter changes in equations</li> <li>• Using graphing calculators or computers for more complex functions</li> </ul>	SE: 216 #45, 394 Example 2 <i>Graphing Calculator Investigation</i> 265, 278-279, 531 <i>Enrichment</i> 230
4. Understand and compare the properties of classes of functions, including exponential, polynomial, rational, and trigonometric functions. <ul style="list-style-type: none"> <li>• Linear vs. non-linear</li> <li>• Symmetry</li> <li>• Increasing/decreasing on an interval</li> </ul>	SE: 226-231, 445 Example 3, 554-560, 626-627 Example 5, 649 Example 3 <i>Study Guide and Review</i> 577 10-5 TWE: IE 557 <i>Enrichment</i> 248 <i>Reading to Learn Mathematics</i> 247 <i>Skills Practice</i> 246
<b>C. Modeling</b>	
1. Use functions to model real-world phenomena and solve problems that involve varying quantities. <ul style="list-style-type: none"> <li>• Linear, quadratic, exponential, periodic (sine and cosine), and step functions (e.g., price of mailing a first-class letter over the past 200 years)</li> <li>• Direct and inverse variation</li> <li>• Absolute value</li> <li>• Expressions, equations and inequalities</li> <li>• Same function can model variety of phenomena</li> <li>• Growth/decay and change in the natural world</li> <li>• Applications in mathematics, biology, and economics (including compound interest)</li> </ul>	SE: 45 Example 5, 47 #20-#21, 173 Example 4, 206 Example 2, 216 #45, 220 Example 3, 230 #44 <i>Algebra Activity</i> 49 <i>How</i> 43, 218
2. Analyze and describe how a change in an independent variable leads to change in a dependent one.	SE: 44 Example 2, 46 #2, 213-214 Example 4, 216 #43-#44, 220 Example 3 <i>Algebra Activity</i> 271 TWE: IE 214
3. Convert recursive formulas to linear or exponential functions (e.g., Tower of Hanoi and doubling).	SE: 234, 235 Example 4, 236 #12-#13, 237 #47, #51, 245 #32 <i>Algebra Activity</i> 241 TWE: IE 235 #4a
<b>D. Procedures</b>	
1. Evaluate and simplify expressions. <ul style="list-style-type: none"> <li>• Add and subtract polynomials</li> <li>• Multiply a polynomial by a monomial or binomial</li> <li>• Divide a polynomial by a monomial</li> </ul>	SE: 410-415, 417-423, 439-443, 444-449, 452-457 <i>Algebra Activity</i> 431, 437, 450-451 TWE: A 415 IE 411, 418-419

CONTENT STANDARDS	PAGE REFERENCES
2. Select and use appropriate methods to solve equations and inequalities. <ul style="list-style-type: none"> <li>• Linear equations - algebraically</li> <li>• Quadratic equations - factoring (when the coefficient of <math>x^2</math> is 1) and using the quadratic formula</li> <li>• All types of equations using graphing, computer, and graphing calculator techniques</li> </ul>	SE: 166-170, 196 #52-#55, 218-223, 491 Example 5, 493 #37-#53, 497 Example 4, 498 Example 5, 546-552 <i>Getting Started</i> 367 <i>Graphing Calculator Investigation</i> 553 <i>Graphing Linear Equations</i> 224-225 TWE: IE 167
3. Judge the meaning, utility, and reasonableness of the results of symbol manipulations, including those carried out by technology.	SE: 17-18 Example 4, 157 Example 4, 274 Example 5, 282 Example 3, 492 Example 6 <i>Algebra Activity</i> 28, 49 <i>Graphing Calculator Investigation</i> 306-307, 333 <i>Reading Mathematics</i> 239
<b>Standard 4.4 (Data Analysis, Probability, and Discrete Mathematics) All students will develop an understanding of the concepts and techniques of data analysis, probability, and discrete mathematics, and will use them to model situations, solve problems, and analyze and draw appropriate inferences from data.</b>	
<b>A. Data Analysis</b>	
1. Use surveys and sampling techniques to generate data and draw conclusions about large groups. <ul style="list-style-type: none"> <li>• Advantages/disadvantages of sample selection methods (e.g., convenience sampling, responses to survey, random sampling)</li> </ul>	SE: 50-55, 711, 712 #28, 713 #30-#32 <i>Algebra Activity</i> 49, 743-744 TWE: IE 51-52
2. Evaluate the use of data in real-world contexts. <ul style="list-style-type: none"> <li>• Accuracy and reasonableness of conclusions drawn</li> <li>• Bias in conclusions drawn (e.g., influence of how data is displayed)</li> <li>• Statistical claims based on sampling</li> </ul>	SE: 50-55, 710-712 #4-#28, 735 #33 <i>Algebra Activity</i> 49, 102, 573, 743-744 TWE: IE 51
3. Design a statistical experiment, conduct the experiment, and interpret and communicate the outcome.	SE: 712 #29 <i>Algebra Activity</i> 347, 622, 783
4. Estimate or determine lines of best fit (or curves of best fit if appropriate) with technology, and use them to interpolate within the range of the data.	SE: <i>Algebra Activity</i> 573 <i>Graphing Calculator Investigation</i> 729-730 TWE: A 730
5. Analyze data using technology, and use statistical terminology to describe conclusions. <ul style="list-style-type: none"> <li>• Measures of dispersion: variance, standard deviation, outliers</li> <li>• Correlation coefficient</li> <li>• Normal distribution (e.g., approximately 95% of the sample lies between two standard deviations on either side of the mean)</li> </ul>	SE: <i>Graphing Calculator Investigation</i> 729-730 <i>Spreadsheet Investigation</i> 56 Technology also can be used with the following example. <i>Algebra Activity</i> 743-744

CONTENT STANDARDS	PAGE REFERENCES
<b>B. Probability</b>	
1. Calculate the expected value of a probability-based game, given the probabilities and payoffs of the various outcomes, and determine whether the game is fair.	SE: 100 #51-#53, 757 #20-#22, #24, 772 Example 4, 774 #24-#27 <i>How</i> 754 <i>Reading to Learn Mathematics</i> 835
2. Use concepts and formulas of area to calculate geometric probabilities.	SE: 100 #51-#53, 775 #44-#47 <i>Enrichment</i> 110
3. Model situations involving probability with simulations (using spinners, dice, calculators and computers) and theoretical models, and solve problems using these models.	SE: 339 #10-#13, 756 #4-#6, 761-762 Example 3, 787 #36-#38 <i>Algebra Activity</i> 783 TWE: AA 783 IE 761 <i>Skills Practice</i> 846 <i>Study Guide and Intervention</i> 831, 843
4. Determine probabilities in complex situations. <ul style="list-style-type: none"> <li>• Conditional events</li> <li>• Complementary events</li> <li>• Dependent and independent events</li> </ul>	SE: 769-776, 777-781, 787 #34-#35 <i>Reading to Learn Mathematics</i> 780 <i>Study Guide and Review</i> 790 14-3 TWE: DI 770 IE 770-771, 778
5. Estimate probabilities and make predictions based on experimental and theoretical probabilities.	SE: 99-100, 770 Example 2, 778 Example 2, 782-788 <i>Algebra Activity</i> 783 TWE: DI 784 IE 761 #3b, 783 TT 785
6. Understand and use the “law of large numbers” (that experimental results tend to approach theoretical probabilities after a large number of trials).	SE: 785 #9-#12, 787 #33 <i>How</i> 782
<b>C. Discrete Mathematics—Systematic Listing and Counting</b>	
1. Calculate combinations with replacement (e.g., the number of possible ways of tossing a coin 5 times and getting 3 heads) and without replacement (e.g., number of possible delegations of 3 out of 23 students).	SE: 760-767 <i>Algebra Activity</i> 102 <i>Extra Practice</i> 851 Lesson 14-2 #8-#19 <i>Practice Test</i> 793 #6-#8 <i>Study Guide and Review</i> 790 14-2 TWE: DI 764 IE 761-763 <i>Skills Practice</i> 840 <i>Study Guide and Intervention</i> 837
2. Apply the multiplication rule of counting in complex situations, recognize the difference between situations with replacement and without replacement, and recognize the difference between ordered and unordered counting situations.	SE: 96, 754-757, 760-767 <i>Algebra Activity</i> 102, 759 TWE: A 758 DI 755 H 754 IE 755-756, 761-763
3. Justify solutions to counting problems.	SE: 708, 756 #3, 757 #18-#22, 763 Example 5 TWE: DI 755 IE 755

CONTENT STANDARDS	PAGE REFERENCES
4. Recognize and explain relationships involving combinations and Pascal's Triangle, and apply those methods to situations involving probability.	SE: 760-767 <i>Algebra Activity</i> 102 <i>Study Guide and Review</i> 790 14-2 TWE: DI 764 IE 761-763 <i>Enrichment</i> 836
<b>D. Discrete Mathematics–Vertex-Edge Graphs and Algorithms</b>	
1. Use vertex-edge graphs and algorithmic thinking to represent and solve practical problems. <ul style="list-style-type: none"> <li>• Circuits that include every edge in a graph</li> <li>• Circuits that include every vertex in a graph</li> <li>• Scheduling problems (e.g., when project meetings should be scheduled to avoid conflicts) using graph coloring</li> <li>• Applications to science (e.g., who-eats-whom graphs, genetic trees, molecular structures)</li> </ul>	SE: 194 Example 4, 195 #37-#43, 460 Example 3, 462 #39-#40, 774 #32-#35 <i>Algebra Activity</i> 759 <i>Practice Test</i> 793 #4-#5 <i>Reading to Learn Mathematics</i> 217 <i>Skills Practice</i> 216
2. Explore strategies for making fair decisions. <ul style="list-style-type: none"> <li>• Combining individual preferences into a group decision (e.g., determining winner of an election or selection process)</li> <li>• Determining how many Student Council representatives each class (9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> grade) gets when the classes have unequal sizes (apportionment)</li> </ul>	This objective can be taught with the following examples. SE: 763 Example 5, 766 #52-#55, 776 #55-#56 <i>How</i> 760
<b>Standard 4.5 (Mathematical Processes) All students will use mathematical processes of problem solving, communication, connections, reasoning, representations, and technology to solve problems and communicate mathematical ideas.</b>	
<b>Cumulative Progress Indicators</b>	
At each grade level, with respect to content appropriate for that grade level, students will:	
<b>A. Problem Solving</b>	
1. Learn mathematics through problem solving, inquiry, and discovery.	SE: 121-125, 142 Example 1, 149-151, 325-328, 453-454, 535 Example 5, 548 Example 3, 567-571, 618 <i>Algebra Activity</i> 141 <i>Enrichment</i> 678 <i>Skills Practice</i> 152 <i>Study Guide and Intervention</i> 149
2. Solve problems that arise in mathematics and in other contexts (cf. workplace readiness standard 8.3). <ul style="list-style-type: none"> <li>• Open-ended problems</li> <li>• Non-routine problems</li> <li>• Problems with multiple solutions</li> <li>• Problems that can be solved in several ways</li> </ul>	SE: 84-85, 87 #56-57, 143-147, 320 Example 6, 548 Example 3, 556 Example 3, 559 #40-41 <i>Reading to Learn Mathematics</i> 171, 665 <i>Skills Practice</i> 170 <i>Study Guide and Intervention</i> 99
3. Select and apply a variety of appropriate problem-solving strategies (e.g., try a simpler problem or make a diagram) to solve problems.	SE: 50-52, 62, 89 Example 2, 121, 618 Example 3, 644 Example 5, 646 #34-36 <i>Algebra Activity</i> 49, 102, 127, 759

CONTENT STANDARDS	PAGE REFERENCES
4. Pose problems of various types and levels of difficulty.	SE: 221 #14-15, 230 #49-51, 456 #52, 552 #51-53, 571 #58-60, 629 #61-62, 656 Example 3 <i>Algebra Activity</i> 49, 759 <i>Graphing Calculator Investigation</i> 306-307 <i>Reading to Learn Mathematics</i> 439 <i>Study Guide and Intervention</i> 255
5. Monitor their progress and reflect on the process of their problem-solving activity.	SE: <i>Standardized Test Practice</i> 64-65, 116-117, 404-405, 638-639, 750-751 TWE: A 134, 211, 597, 728, 776
<b>B. Communication</b>	
1. Use communication to organize and clarify their mathematical thinking. <ul style="list-style-type: none"> <li>• Reading and writing</li> <li>• Discussion, listening, and questioning</li> </ul>	SE: 46 #1-3, 122-123, 283 #1-3, 570 #1-3, 595 #1-3, 764 #1-2 <i>Reading Mathematics</i> 165, 263, 338, 768
2. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others, both orally and in writing.	SE: 46 #1-3, 122-123, 283 #1-3, 570 #1-3, 595 #1-3, 764 #1-2 <i>Reading Mathematics</i> 263, 338, 768 TWE: DI 121
3. Analyze and evaluate the mathematical thinking and strategies of others.	SE: 29 #3, 52 Example 4, 98 #3, 138 #3, 236 #3, 329 #3, 413 #3, 504 #4, 600 #4 TWE: DI 121
4. Use the language of mathematics to express mathematical ideas precisely.	SE: <i>Reading Mathematics</i> 10, 424, 507, 566, 631, 768 TWE: DI 22, 72, 97 TNT 156
<b>C. Connections</b>	
1. Recognize recurring themes across mathematical domains (e.g., patterns in number, algebra, and geometry).	SE: 240-245, 256-259, 268 #43-#44, 292-295, 554-557, 616-620, 708-710 <i>Reading Mathematics</i> 714 <i>Reading to Learn Mathematics</i> 285
2. Use connections among mathematical ideas to explain concepts (e.g., two linear equations have a unique solution because the lines they represent intersect at a single point).	SE: 369-371, 373 #48-50, 382-384, 387-390, 391 #27-38 <i>Reading Mathematics</i> 393 TWE: DI 372 <i>Reading to Learn Mathematics</i> 465 <i>Study Guide and Intervention</i> 461
3. Recognize that mathematics is used in a variety of contexts outside of mathematics.	SE: 147 #51-52, 201 #9-10, 245 #29-#30, 268 #45-#46, 303 #16-#17, 556 Example 3, 646 #37, 712 #24-#28, 719 #39-#41 <i>Reading to Learn Mathematics</i> 859 <i>Skills Practice</i> 346, 858
4. Apply mathematics in practical situations and in other disciplines.	SE: 268 #45-46, 269 #54-55, 484 #13-15, 485 #60-61, 556 Example 3, 596 #43-44 <i>Reading Mathematics</i> 714 <i>Why</i> 240 <i>Enrichment</i> 310 <i>Skills Practice</i> 714

CONTENT STANDARDS	PAGE REFERENCES
5. Trace the development of mathematical concepts over time and across cultures (cf. world languages and social studies standards).	SE: 605 <i>Algebra Activity</i> 102 #6 <i>How</i> 539, 623 <i>Reading Mathematics</i> 263, 714 TWE: DI 235 <i>Enrichment</i> 836
6. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	SE: 611-612, 655-656 TWE: H 68, 73, 103, 192, 212, 318 DI 235 TNT 327
<b>D. Reasoning</b>	
1. Recognize that mathematical facts, procedures, and claims must be justified.	SE: 37-39, 40 #7-9, 240-243 <i>Reading Mathematics</i> 239 <i>Study Guide and Review</i> 61 1-7 <i>Enrichment</i> 42 <i>Skills Practice</i> 40
2. Use reasoning to support their mathematical conclusions and problem solutions.	SE: 37-39, 40 #13-16, 41 #47-49, 240-243 <i>Reading Mathematics</i> 239 <i>Study Guide and Review</i> 61 1-7 <i>Enrichment</i> 42 <i>Skills Practice</i> 40
3. Select and use various types of reasoning and methods of proof.	SE: 37-39, 40 #4-6, 240-243 <i>Reading Mathematics</i> 239 <i>Study Guide and Review</i> 61 1-7 TWE: A 42 <i>Enrichment</i> 42 <i>Reading to Learn Mathematics</i> 41 <i>Skills Practice</i> 40 <i>Study Guide and Intervention</i> 37
4. Rely on reasoning, rather than answer keys, teachers, or peers, to check the correctness of their problem solutions.	SE: 37-39, 40 #13-16, 240-243, 244 #27-28, 245 #31-33 <i>Reading Mathematics</i> 239 <i>Study Guide and Review</i> 61 1-7 <i>Enrichment</i> 42 <i>Skills Practice</i> 40
5. Make and investigate mathematical conjectures. <ul style="list-style-type: none"> <li>• Counterexamples as a means of disproving conjectures</li> <li>• Verifying conjectures using informal reasoning or proofs.</li> </ul>	SE: 37-39, 40 #13-16 <i>Algebra Activity</i> 28, 49, 122, 431, 501, 783 <i>Graphing Calculator Investigation</i> 418 <i>Reading Mathematics</i> 424
6. Evaluate examples of mathematical reasoning and determine whether they are valid.	SE: 37-39, 40 #4-6, 41 #47-49, 42 #50, 61, 240-243 <i>Reading Mathematics</i> 239 <i>Study Guide and Review</i> 61 1-7 <i>Enrichment</i> 42 <i>Skills Practice</i> 40 <i>Study Guide and Intervention</i> 37

CONTENT STANDARDS	PAGE REFERENCES
<b>E. Representations</b>	
1. Create and use representations to organize, record, and communicate mathematical ideas. <ul style="list-style-type: none"> <li>• Concrete representations (e.g., base-ten blocks or algebra tiles)</li> <li>• Pictorial representations (e.g., diagrams, charts, or tables)</li> <li>• Symbolic representations (e.g., a formula)</li> <li>• Graphical representations (e.g., a line graph)</li> </ul>	SE: 167 Example 3, 218-223, 352-354, 546-551 <i>Algebra Activity</i> 127, 437-438, 480, 487-488, 495, 759 <i>Study Tip</i> 234 <i>Reading to Learn Mathematics</i> 659 <i>Skills Practice</i> 252 <i>Study Guide and Intervention</i> 249
2. Select, apply, and translate among mathematical representations to solve problems.	SE: 235 Example 4, 256-261, 282, 292-297, 458-461 <i>Algebra Activity</i> 28, 49, 127 <i>Reading to Learn Mathematics</i> 303 <i>Skills Practice</i> 302
3. Use representations to model and interpret physical, social, and mathematical phenomena.	SE: 133 #62-64, 206 Example 2, 260 #35-36, 261 #53-55, 269 #48-51, 282, 303 #18-23 <i>Algebra Activity</i> 271, 431, 437-438 <i>Reading to Learn Mathematics</i> 159, 303, 347 <i>Skills Practice</i> 158, 302, 346 <i>Study Guide and Intervention</i> 155, 299, 343
<b>F. Technology</b>	
1. Use technology to gather, analyze, and communicate mathematical information.	SE: 210 #53-56, 217 #52-55, 538 #51-52, 728 #26-29 <i>Graphing Calculator Investigation</i> 224-225, 531-532, 729-730 <i>Spreadsheet Investigation</i> 56, 178, 232, 368
2. Use computer spreadsheets, software, and graphing utilities to organize and display quantitative information.	SE: 210 #53-56, 217 #52-55, 538 #51-52, 728 #26-29 <i>Graphing Calculator Investigation</i> 224-225, 531-532, 729-730 <i>Spreadsheet Investigation</i> 56, 178, 232, 368
3. Use graphing calculators and computer software to investigate properties of functions and their graphs.	SE: 530 #54-59, 535 Example 5, 537 #48 <i>Graphing Calculator Investigation</i> 204, 531-532, 545, 553, 556, 604
4. Use calculators as problem-solving tools (e.g., to explore patterns, to validate solutions).	SE: 15 #48-50, 294 Example 3, 337 #56-58, 787 #36-38 <i>Graphing Calculator Investigation</i> 265, 333, 358, 531-532, 600, 654
5. Use computer software to make and verify conjectures about geometric objects.	SE: <i>Spreadsheet Investigation</i> 368
6. Use computer-based laboratory technology for mathematical applications in the sciences.	SE: <i>WebQuest Internet Project</i> 407, 429, 479, 537, 572

## Codes Used for TWE Pages

A	Assess
AA	Algebra Activity
DI	Daily Intervention
H	How
IE	In-Class Examples
TNT	Tips for New Teachers
TT	Teacher to Teacher