



# Algebra

Concepts and Applications

© 2006

STANDARDS		PAGE REFERENCES
<b>Strand 1: Number Sense and Operations</b>		
Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.		
<b>Concept 1: Number Sense</b>		
Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.		
PO 1. Classify real numbers as members of one or more subsets: natural, whole, integers, rational, or irrational numbers.	<p><b>Student Edition:</b> 52, 94, 97 #1, 600-605, 611 #1-#3, 619 #44-#46, 630 #11-#14, 633 #3-#6</p> <p><b>Teacher Wraparound Edition:</b> A 605; FA 601; ICE 602; RA 97, 602; T 94; TT 53, 601</p>	
PO 2. Identify properties of the real number system: commutative, associative, distributive, identity, inverse, and closure.	<p><b>Student Edition:</b> 14-18, 19-23, 29 #24, 45 #20-#25</p> <p><b>Teacher Wraparound Edition:</b> A 18, 23; EA 17; EC 18, 23; F 19; ICE 15, 16; RA 16; T 14; TT 15, 16</p>	

STANDARDS	PAGE REFERENCES
PO 3. Distinguish between finite and infinite sets of numbers.	<b>Student Edition:</b> 110-111, 315 #40, 494-495 <b>Teacher Wraparound Edition:</b> A 111, 495; MTL 494; O 110
<b>Concept 2: Numerical Operations</b> Understand and apply numerical operations and their relationship to one another.	
PO 1. Select the grade-level appropriate operation to solve word problems.	<b>Student Edition:</b> 8-13, 54-57, 64-69, 70-74, 100-103, 154-159, 336-340, 341-345, 347-351, 357-361 <b>Teacher Wraparound Edition:</b> F 8; ICE 9, 67, 72; MTL 64, 70; TT 65
PO 2. Solve word problems using grade-level appropriate operations and numbers.	<b>Student Edition:</b> 8-13, 54-57, 64-69, 70-74, 100-103, 154-159, 336-340, 341-345, 347-351, 357-361 <b>Teacher Wraparound Edition:</b> F 8; ICE 9, 67, 72; MTL 64, 70; TT 65
PO 3. Simplify numerical expressions including signed numbers and absolute values.	<b>Student Edition:</b> 55 ex 6-ex 7, 56 #39-#44, 63 #5, 64-69, 70-74, 75-79 <b>Teacher Wraparound Edition:</b> A 69, 74, 79; EC 57, 69, 74; ICE 5; RA 77
PO 4. Apply subscripts to represent ordinal position.	<b>Student Edition:</b> 110-111, 494-495
PO 5. Use grade-level appropriate mathematical terminology.	<b>Student Edition:</b> 8-13, 14-18, 38-43, 117-121, 146-151, 302-307 <i>Investigation</i> 152-153, 210-211 <b>Teacher Wraparound Edition:</b> A 387, 571; F 8; ICE 15, 16; T 8; TT 9, 14
PO 6. Compute using scientific notation.	<b>Student Edition:</b> 352-356, 361 #46-#49, 375 #37-#45, 377 #12-#15, 425 #67 <b>Teacher Wraparound Edition:</b> A 356; EA 355; EC 356; ICE 353, 354; MTL 352; RA 354; T 352

STANDARDS	PAGE REFERENCES
PO 7. Simplify numerical expressions using the order of operations.	<p><b>Student Edition:</b> 8-13, 18 #28-#32, 23 #46-#47, 45 #15-#19, 47 #6-#8</p> <p><b>Teacher Wraparound Edition:</b> A 13; BQ 47; EA 11; EC 13; ICE 9, 10; MTL 8; RA 11; TT 9</p>
<p><b>Concept 3: Estimation</b> Use estimation strategies reasonably and fluently.</p>	
PO 1. Solve grade-level appropriate problems using estimation.	<p><b>Student Edition:</b> 302, 315 #39, 340 #43, 363, 365 #37, 371 #37-#40 <i>Hands-On Algebra</i> 362</p>
PO 2. Determine if a solution to a problem is reasonable.	<p><b>Student Edition:</b> 24-29</p> <p><b>Teacher Wraparound Edition:</b> GCE 26; MTL 24; TT 25, 26</p>
PO 3. Determine rational approximations of irrational numbers.	<p><b>Student Edition:</b> 362-365, 371 #37-#40, 376 #49-#53, 377 #16-#19</p> <p><b>Teacher Wraparound Edition:</b> A 365; EA 364; EC 365; ICE 363; MTL 362; RA 364</p>
<p><b>Strand 2: Data Analysis, Probability, and Discrete Mathematics</b></p>	
<p>Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning &amp; Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.</p>	
<p><b>Concept 1: Data Analysis (Statistics)</b> Understand and apply data collection, organization and representation to analyze and sort data.</p>	
PO 1. Formulate questions to collect data in contextual situations.	<p><b>Student Edition:</b> 32-37</p> <p><b>Teacher Wraparound Edition:</b> FA 36; FTC 109; ICE 33, 34; MTL 32; RA 34; TT 33</p>

STANDARDS	PAGE REFERENCES
PO 2. Organize collected data into an appropriate graphical representation.	<b>Student Edition:</b> 38-43, 46 #40-#47, 210-211, 302-307, 308-309, 315 #41  <b>Teacher Wraparound Edition:</b> A 43, 307; FTC 109; ICE 39, 40, 41, 304; MTL 303
PO 3. Display data as lists, tables, matrices, and plots.	<b>Student Edition:</b> 38-43, 46 #40-#47, 210-211, 302-307, 308-309, 315 #41  <b>Teacher Wraparound Edition:</b> A 43, 307; FTC 109; ICE 39, 40, 41, 304; MTL 303
PO 4. Construct equivalent displays of the same data.	<b>Student Edition:</b> 32-37, 38-43, 210-211, 302-307  <b>Teacher Wraparound Edition:</b> A 43; RA 34
PO 5. Identify graphic misrepresentations and distortions of sets of data.	<b>Teacher Wraparound Edition:</b> EA 305
PO 6. Identify which of the measures of central tendency is most appropriate in a given situation.	<b>Student Edition:</b> 104-109, 116 #41-#42, 121 #42, 127 #49  <b>Teacher Wraparound Edition:</b> A 109; EC 109; FA 108; FTC 106, 109; GCE 105; ICE 105, 106; MTL 104; RA 107; T 105
PO 7. Make reasonable predictions based upon linear patterns in data sets or scatter plots.	<b>Student Edition:</b> 302-307, 308-309, 329 #26-#27  <b>Teacher Wraparound Edition:</b> A 307, 309; ICE 303, 304; MTL 303, 308; RA 304
PO 8. Make reasonable predictions for a set of data, based on patterns.	<b>Student Edition:</b> 302-307, 308-309, 329 #26-#27  <b>Teacher Wraparound Edition:</b> A 307, 309; ICE 303, 304; MTL 303, 308; RA 304
PO 9. Draw inferences from charts, tables, graphs, plots, or data sets.	<b>Student Edition:</b> 302-307, 308-309, 329 #26-#27  <b>Teacher Wraparound Edition:</b> A 307, 309; ICE 303, 304; MTL 303, 308; RA 304

STANDARDS	PAGE REFERENCES
PO 10. Apply the concepts of mean, median, mode, range, and quartiles to summarize data sets.	<b>Student Edition:</b> 104-109, 116 #41-#42, 121 #42, 127 #49  <b>Teacher Wraparound Edition:</b> A 109; EC 109; FA 108; FTC 106, 109; GCE 105; ICE 105, 106; MTL 104; RA 107; T 105
PO 11. Evaluate the reasonableness of conclusions drawn from data analysis.	<b>Student Edition:</b> 302-307, 308-309, 329 #26-#27  <b>Teacher Wraparound Edition:</b> A 307, 309; ICE 303, 304; MTL 303, 308; RA 304
PO 12. Recognize and explain the impact of interpreting data (making inferences or drawing conclusions) from a biased sample.	<b>Student Edition:</b> 32 ex 1, 34 #3-#4, 35 #10-#15, 36 #20-#21, 37 #23, 43 #24-#25  <b>Teacher Wraparound Edition:</b> ICE 33
PO 13. Draw a line of best fit for a scatter plot.	<b>Student Edition:</b> 302-307, 308-309, 329 #26-#27  <b>Teacher Wraparound Edition:</b> A 307, 309; ICE 303, 304; MTL 303, 308; RA 304
PO 14. Determine whether displayed data has positive, negative, or no correlation.	<b>Student Edition:</b> 302-307, 308-309, 329 #26-#27  <b>Teacher Wraparound Edition:</b> A 307, 309; ICE 303, 304; MTL 303, 308; RA 304
PO 15. Identify a normal distribution.	This standard can be met in Glencoe's <i>Advanced Mathematical Concepts: Precalculus with Applications</i> © 2006  <b>Student Edition:</b> 918-925
PO 16. Identify differences between sampling and census.	<b>Student Edition:</b> 32 ex 1, 34 #3-#4, 35 #10-#15, 36 #20-#21, 37 #23, 43 #24-#25  <b>Teacher Wraparound Edition:</b> ICE 33

STANDARDS	PAGE REFERENCES
PO 17. Identify differences between biased and unbiased samples.	<b>Student Edition:</b> 32 ex 1, 34 #3-#4, 35 #10-#15, 36 #20-#21, 37 #23, 43 #24-#25  <b>Teacher Wraparound Edition:</b> ICE 33
<b>Concept 2: Probability</b> Understand and apply the basic concepts of probability.	
PO 1. Find the probability that a specific event will occur, with or without replacement.	<b>Student Edition:</b> 219-223, 224-229, 232 #37-#43, 233 #20  <b>Teacher Wraparound Edition:</b> A 223; EC 223, 229; F 224; HA 224; ICE 220, 221, 225, 226, 227; MTL 219
PO 2. Determine simple probabilities related to geometric figures.	<b>Student Edition:</b> 649 #43
PO 3. Predict the outcome of a grade-level appropriate probability experiment.	<b>Student Edition:</b> 406 ex 5, 649 #43 <i>Hands-On Algebra</i> 220, 224  <b>Teacher Wraparound Edition:</b> A 223; EC 229; HA 220, 225; MTL 219, 224
PO 4. Record the data from performing a grade-level appropriate probability experiment.	<b>Student Edition:</b> 406 ex 5, 649 #43 <i>Hands-On Algebra</i> 220, 224  <b>Teacher Wraparound Edition:</b> A 223; EC 229; HA 220, 225; MTL 219, 224
PO 5. Compare the outcome of an experiment to predictions made prior to performing the experiment.	<b>Student Edition:</b> 406 ex 5, 649 #43 <i>Hands-On Algebra</i> 220, 224  <b>Teacher Wraparound Edition:</b> A 223; EC 229; HA 220, 225; MTL 219, 224
PO 6. Distinguish between independent and dependent events.	<b>Student Edition:</b> 224-225, 227 #2  <b>Teacher Wraparound Edition:</b> MTL 224; TT 225

STANDARDS	PAGE REFERENCES
PO 7. Compare the results of two repetitions of the same grade-level appropriate probability experiment.	<b>Student Edition:</b> 406 ex 5, 649 #43 <i>Hands-On Algebra</i> 220, 224 <b>Teacher Wraparound Edition:</b> A 223; EC 229; HA 220, 225; MTL 219, 224
<b>Concept 3: Discrete Mathematics – Systematic Listing and Counting</b> Understand and demonstrate the systematic listing and counting of possible outcomes.	
PO 1. Determine the number of possible outcomes for a contextual event using a chart, a tree diagram, or the counting principle.	<b>Student Edition:</b> 146-151, 158 #51, 159 #4-#6, 174 #42, 181 #19-#20, 183 #8-#10 <b>Teacher Wraparound Edition:</b> A 151; EC 151; ICE 147, 148; MTL 146, 152; RA 148; TT 148
PO 2. Determine when to use combinations versus permutations in counting objects.	<b>Student Edition:</b> 152-153, 280-281 <b>Teacher Wraparound Edition:</b> A 153; FTC 153; MTL 152
PO 3. Use combinations or permutations to solve contextual problems.	<b>Student Edition:</b> 152-153, 280-281 <b>Teacher Wraparound Edition:</b> A 153; FTC 153; MTL 152

STANDARDS	PAGE REFERENCES
<p><b>Concept 4: Vertex-Edge Graphs</b>            Understand and apply vertex-edge graphs.  <i>(Grades K-8)</i></p>	
<p><b>Strand 3: Patterns, Algebra, and Functions</b></p>	
<p>Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning &amp; Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.</p>	
<p><b>Concept 1: Patterns</b>            Identify patterns and apply pattern recognition to reason mathematically.</p>	
<p>PO 1. Communicate a grade-level appropriate iterative or recursive pattern, using symbols or numbers.</p>	<p><b>Student Edition:</b>            110-111, 315 #40, 494-495  <b>Teacher Wraparound Edition:</b>            A 111, 495; MTL 494; TT 495</p>
<p>PO 2. Find the <math>n^{\text{th}}</math> term of an iterative or recursive pattern.</p>	<p><b>Student Edition:</b>            110-111, 494-495  <b>Teacher Wraparound Edition:</b>            A 111; MTL 494</p>
<p>PO 3. Evaluate problems using basic recursion formulas.</p>	<p><b>Student Edition:</b>            110-111, 315 #40, 494-495  <b>Teacher Wraparound Edition:</b>            A 111, 495; MTL 494</p>
<p><b>Concept 2: Functions and Relationships</b>            Describe and model functions and their relationships.</p>	
<p>PO 1. Determine if a relationship is a function, given a graph, table, or set of ordered pairs.</p>	<p><b>Student Edition:</b>            256-261, 263 #2d, 269 #1-#2, 275 #32, 277 #33-#35, 279 #11-#12  <b>Teacher Wraparound Edition:</b>            A 261; ICE 256, 257; TT 257</p>
<p>PO 2. Describe a contextual situation that is depicted by a given graph.</p>	<p><b>Student Edition:</b>            256-261, 262-263, 284 ex 1 – ex 2, 287 #2, 291 ex 3, 292 ex 4, 293 #10-#11, 425 #68, 553 #32  <i>Graphing Calculator Exploration 272</i></p>

STANDARDS	PAGE REFERENCES
PO 3. Identify a graph that models a given real-world situation.	<p><b>Student Edition:</b> 256-261, 262-263, 284 ex 1 – ex 2, 287 #2, 291 ex 3, 292 ex 4, 293 #10-#11, 425 #68, 553 #32</p> <p><i>Graphing Calculator Exploration 272</i></p>
PO 4. Sketch a graph that models a given contextual situation.	<p><b>Student Edition:</b> 256-261, 262-263, 284 ex 1 – ex 2, 287 #2, 291 ex 3, 292 ex 4, 293 #10-#11, 425 #68, 553 #32</p> <p><i>Graphing Calculator Exploration 272</i></p>
PO 5. Determine domain and range for a function.	<p><b>Student Edition:</b> 238-243, 255 #44, 289 #29, 301 #51-#52, 304 ex 2, 305 #1, 308-309, 371 #47</p> <p><b>Teacher Wraparound Edition:</b> A 243; EA 241; EC 243; ICE 239, 240</p>
PO 6. Determine the solution to a contextual maximum/minimum problem, given the graphical representation.	<p><b>Student Edition:</b> 305 #5, 459 #42, 460 ex 3, 461 #15, 463 #43, 473 #10</p> <p><b>Teacher Wraparound Edition:</b> A 463; EA 461; EC 463; FTC 462; ICE 460</p>
PO 7. Express the relationship between two variables using tables/matrices, equations, or graphs.	<p><b>Student Edition:</b> 256-261, 262-263, 264-269, 270-275, 290-295, 296-301, 310-315, 316-321, 331 #6-#8</p> <p><b>Teacher Wraparound Edition:</b> ICE 267; MTL 311</p>
PO 8. Interpret the relationship between data suggested by tables/matrices, equations, or graphs.	<p><b>Student Edition:</b> 256-261, 262-263, 264-269, 270-275, 290-295, 296-301, 310-315, 316-321, 331 #6-#8</p> <p><b>Teacher Wraparound Edition:</b> ICE 267; MTL 311</p>
PO 9. Determine from two linear equations whether the lines are parallel, perpendicular, coincident, or intersecting but not perpendicular.	<p><b>Student Edition:</b> 322-327, 330 #36-#39, 331 #19</p> <p><b>Teacher Wraparound Edition:</b> A 327; EC 327; HA 324; ICE 323, 324, 325; MTL 322; RA 325; TT 325</p>

STANDARDS	PAGE REFERENCES
<p><b>Concept 3: Algebraic Representations</b>            Represent and analyze mathematical situations and structures using algebraic representations.</p>	
PO 1. Evaluate algebraic expressions, including absolute value and square roots.	<p><b>Student Edition:</b>            614-619, 620-623, 631 #31-#32, 633 #21-#22</p> <p><b>Teacher Wraparound Edition:</b>            EC 619, 623; F 620; ICE 615, 616, 617, 621;            RA 617; TT 617</p>
PO 2. Simplify algebraic expressions.	<p><b>Student Edition:</b>            14-18, 19-23, 29 #20-#23, 37 #26, 43 #27,            45 #20-#31, 47 #16-#18, 57 #54-#59</p> <p><b>Teacher Wraparound Edition:</b>            A 23; EC 18, 23; F 19; ICE 15, 20</p>
PO 3. Multiply and divide monomial expressions with integral exponents.	<p><b>Student Edition:</b>            341-345, 347-351, 356 #51-#59, 361 #50-#53,            375 #21-#36, 377 #8-#11</p> <p><b>Teacher Wraparound Edition:</b>            A 345, 351; EC 351; F 341, 347, 352; ICE 342,            343, 344, 348, 349; RA 344</p>
PO 4. Translate a written expression or sentence into a mathematical expression or sentence.	<p><b>Student Edition:</b>            4-7, 11 #2, 13 #58-#61, 23 #48, 24-29, 37 #28,            44 #11-#14, 47 #3-#5</p> <p><b>Teacher Wraparound Edition:</b>            A 7, 29; F 24; ICE 5, 6; RA 6</p>
PO 5. Translate a sentence written in context into an algebraic equation involving multiple operations.	<p><b>Student Edition:</b>            4-7, 11 #2, 13 #58-#61, 23 #48, 24-29, 37 #28,            44 #11-#14, 47 #3-#5</p> <p><b>Teacher Wraparound Edition:</b>            A 7, 29; F 24; ICE 5, 6; RA 6</p>
PO 6. Write a linear equation for a table of values.	<p><b>Student Edition:</b>            290-295, 301 #48, 329 #19, 331 #9-#11</p> <p><b>Teacher Wraparound Edition:</b>            A 295; EA 293; ICE 291, 292; MTL 290; RA 293;            TT 291</p>

STANDARDS	PAGE REFERENCES
PO 7. Write a linear algebraic sentence that represents a data set that models a contextual situation.	<b>Student Edition:</b> 256-261, 262-263, 284 ex 1 – ex 2, 287 #2, 291 ex 3, 292 ex 4, 293 #10-#11, 425 #68, 553 #32 <i>Graphing Calculator Exploration 272</i>
PO 8. Solve linear (first degree) equations in one variable (may include absolute value).	<b>Student Edition:</b> 117-121, 122-127, 128-131, 133 #32-#37, 134 #40-#47, 135 #19-#24 <b>Teacher Wraparound Edition:</b> A 121; EC 121, 127; F 122, 128; ICE 117, 123, 124, 125, 129, 130; TT 118, 129
PO 9. Solve linear inequalities in one variable.	<b>Student Edition:</b> 509-513, 514-518, 519-523, 524-529, 530-534, 539 #36-#39, 543 #17-#32 <b>Teacher Wraparound Edition:</b> A 513, 518, 523; EC 513, 518, 523; F 514, 519, 524; ICE 510, 515, 516, 520
PO 10. Write an equation of the line given: two points on the line, the slope and a point on the line, or the graph of the line.	<b>Student Edition:</b> 290-295, 296-301, 329 #15-#25, 331 #6-#11 <b>Teacher Wraparound Edition:</b> A 295, 301; EC 295, 301; F 296; ICE 291, 292, 297, 298; RA 293, 299
PO 11. Solve an algebraic proportion.	<b>Student Edition:</b> 188-193, 197 #18, 203 #1-#2, 231 #11-#14, 233 #3-#6 <b>Teacher Wraparound Edition:</b> A 193; EC 193; F 194; ICE 189, 190, 191; RA 191; TT 192
PO 12. Solve systems of linear equations in two variables (integral coefficients and rational solutions).	<b>Student Edition:</b> 550-553, 554-559, 560-565, 566-571, 572-577 <b>Teacher Wraparound Edition:</b> A 656; EC 553, 559, 565, 571; F 554, 560; ICE 550, 551, 552, 556, 557, 561, 562, 563
PO 13. Add, subtract, and perform scalar multiplication with matrices.	<b>Student Edition:</b> 80-81 <b>Teacher Wraparound Edition:</b> A 81; M 81; MTL 80

STANDARDS	PAGE REFERENCES
PO 14. Calculate powers and roots of real numbers, both rational and irrational, using technology when appropriate.	<p><b>Student Edition:</b> 336-340, 357-361, 362-365, 371 #41-#44</p> <p><b>Teacher Wraparound Edition:</b> A 361, 365; EC 360, 361, 365; F 341, 347; GCE 338; ICE 337, 338, 342, 343, 344, 348, 349; RA 339; TT 338</p>
PO 15. Simplify square roots and cube roots with monomial radicands (including those with variables) that are perfect squares or perfect cubes.	<p><b>Student Edition:</b> 614-619, 620-623, 631 #31-#32, 633 #21-#22</p> <p><b>Teacher Wraparound Edition:</b> EC 619, 623; F 620; ICE 615, 616, 617, 621; RA 617; TT 617</p>
PO 16. Solve square root radical equations involving only one radical.	<p><b>Student Edition:</b> 624-629, 632 #41-#50, 633 #23-#24</p> <p><b>Teacher Wraparound Edition:</b> A 629; ICE 625, 626, 627; MTL 624; RA 628</p>
PO 17. Solve quadratic equations.	<p><b>Student Edition:</b> 468-473, 474-477, 478-482, 483-487, 498 #39-#46</p> <p><b>Teacher Wraparound Edition:</b> A 473, 477; EC 473; F 474, 478, 483; ICE 469, 470, 475, 476, 479, 484, 485; RA 471, 475</p>
PO 18. Identify the sine, cosine, and tangent ratios of the acute angles of a right triangle.	<p>This standard can be met in Glencoe's <i>Mathematics: Applications and Concepts Course 3</i> © 2006</p> <p><b>Student Edition:</b> 192-193</p>
<p><b>Concept 4: Analysis of Change</b> Analyze change in a variable over time and in various contexts.</p>	
PO 1. Determine slope, x-, and y-intercepts of a linear equation.	<p><b>Student Edition:</b> 284-289, 310 ex 1, 311 ex 2, 314 #12-#23, 315 #36, 321 #2-#4, 329 #28-#29</p> <p><b>Teacher Wraparound Edition:</b> A 289; EC 289; F 290, 316; ICE 285, 286, 311, 312; MTL 311; RA 286</p>