



Algebra 1

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STANDARDS	PAGE REFERENCES
GRADES 7-11	
Algebra	
Understand the concept of proportionality in real-world and mathematical situations, and distinguish between proportional and other relationships.	
7.2.1.1	
<p>Understand that a relationship between two variables, x and y, is proportional if it can be expressed in the form $\frac{y}{x}=k$ or $y=kx$. Distinguish proportional relationships from other relationships, including inversely proportional relationships ($xy=k$ or $y=\frac{k}{x}$).</p>	<p>Student Edition: 172-176, 196-202, 577-582 <i>Graphing Calculator Lab</i> 197, 576</p> <p>Teacher Wraparound Edition: Pre-AP 199</p> <p>Also see the additional references in <i>Glencoe Algebra 1 Chapter Resource Masters on the following pages.</i> <i>Chapter 4 Resource Masters</i> 18 <i>Chapter 11 Resource Masters</i> 11</p>
7.2.1.2	
<p>Understand that the graph of a proportional relationship is a line through the origin whose slope is the unit rate (constant of proportionality). Know how to use graphing technology to examine what happens to a line when the unit rate is changed.</p>	<p>Student Edition: 172-176, 196-202 <i>Graphing Calculator Lab</i> 197</p> <p>Teacher Wraparound Edition: Pre-AP 199</p>

STANDARDS	PAGE REFERENCES
<p>Recognize proportional relationships in real-world and mathematical situations; represent these and other relationships with tables, verbal descriptions, symbols and graphs; solve problems involving proportional relationships and explain results in the original context.</p>	
<p>7.2.2.1</p>	
<p>Represent proportional relationships with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another. Determine the unit rate (constant of proportionality or slope) given any of these representations.</p>	<p>Student Edition: 143-148, 149-154, 155-161, 165-170, 172-176 <i>Graphing Calculator Lab</i> 197 Teacher Wraparound Edition: Pre-AP 161</p>
<p>7.2.2.2</p>	
<p>Solve multi-step problems involving proportional relationships in numerous contexts.</p>	<p>Student Edition: 105-110, 111-115, 172-176, 626-632 <i>Reading Mathematics</i> 116</p>
<p>7.2.2.3</p>	
<p>Use knowledge of proportions to assess the reasonableness of solutions.</p>	<p>Student Edition: 107 Ex4, 114 #39, 115 #41 Teacher Wraparound Edition: Pre-AP 112</p>
<p>7.2.2.4</p>	
<p>Represent real-world or mathematical situations using equations and inequalities involving variables and positive and negative rational numbers.</p>	<p>Student Edition: 70-76, 78-84, 85-90, 92-97, 98-103, 105-110, 111-115, 122-128, 215 Ex3, 216 #8-#9, 224 #36-#41, 227-233, 262 Ex3, 264 #26-#29, 269 #23-#27, 274-275 Ex4, 277 #26, 280-284, 294-299, 301-307, 308-313 <i>Algebra Lab</i> 72</p>
<p>Apply understanding of order of operations and algebraic properties to generate equivalent numerical and algebraic expressions containing positive and negative rational numbers and grouping symbols; evaluate such expressions.</p>	
<p>7.2.3.1</p>	
<p>Generate equivalent numerical and algebraic expressions containing rational numbers and whole number exponents. Properties of algebra include associative, commutative and distributive laws.</p>	<p>Student Edition: 6-9, 10-14, 21-25, 26-31, 33-37, 46-52 <i>Algebra Lab</i> 27</p>

STANDARDS	PAGE REFERENCES
<p>7.2.3.2</p> <p>Evaluate algebraic expressions containing rational numbers and whole number exponents at specified values of their variables.</p>	<p>Student Edition: 10-14, 15-20, 37 #58-#61</p>
<p>7.2.3.3</p> <p>Apply understanding of order of operations and grouping symbols when using calculators and other technologies.</p>	<p>Student Edition: 10-14</p> <p>Teacher Wraparound Edition: F11</p> <p>Also see the additional references in <i>Glencoe Algebra 1 Chapter Resource Masters</i> on the following page. <i>Chapter 1 Resource Masters 18</i></p>
<p>Represent real-world and mathematical situations using equations with variables. Solve equations symbolically, using the properties of equality. Also solve equations graphically and numerically. Interpret solutions in the original context.</p>	
<p>7.2.4.1</p> <p>Represent relationships in various contexts with equations involving variables and positive and negative rational numbers. Use the properties of equality to solve for the value of a variable. Interpret the solution in the original context.</p>	<p>Student Edition: 6-9, 70-76, 78-84, 85-90, 92-97, 98-103, 105-110, 111-115, 122-128, 143-148 <i>Algebra Lab</i> 72, 77, 91, 142 <i>Reading Mathematics</i> 116 <i>Spreadsheet Lab</i> 129</p>
<p>7.2.4.2</p> <p>Solve equations resulting from proportional relationships in various contexts.</p>	<p>Student Edition: 105-110, 111-115, 122-128 <i>Reading Mathematics</i> 116 <i>Spreadsheet Lab</i> 129</p> <p>Also see the additional references in <i>Glencoe Algebra 1 Chapter Resource Masters</i> on the following page. <i>Chapter 2 Resource Masters 25</i></p>
<p>Understand the concept of function in real-world and mathematical situations, and distinguish between linear and non-linear functions.</p>	
<p>8.2.1.1</p> <p>Understand that a function is a relationship between an independent variable and a dependent variable in which the value of the independent variable determines the value of the dependent variable. Use functional notation, such as $f(x)$, to represent such relationships.</p>	<p>Student Edition: 53-58, 149-154, 155-161 <i>Algebra Lab</i> 59</p> <p>Teacher Wraparound Edition: F 151; I 54; TNT 151</p>

STANDARDS	PAGE REFERENCES
<p>8.2.1.2</p> <p>Use linear functions to represent relationships in which changing the input variable by some amount leads to a change in the output variable that is a constant times that amount.</p>	<p>Student Edition: 155-161, 165-170, 172-176, 187-195, 1196-202 <i>Algebra Lab</i> 186</p>
<p>8.2.1.3</p> <p>Understand that a function is linear if it can be expressed in the form $f(x)=mx+b$ or if its graph is a straight line.</p>	<p>Student Edition: 155-161, 204-209 <i>Algebra Lab</i> 203</p>
<p>8.2.1.4</p> <p>Understand that an arithmetic sequence is a linear function that can be expressed in the form $f(x)=mx+b$, where $x = 0, 1, 2, 3, \dots$</p>	<p>Student Edition: 165-170, 187-195, 204-209 <i>Algebra Lab</i> 186, 210-211</p>
<p>8.2.1.5</p> <p>Understand that a geometric sequence is a non-linear function that can be expressed in the form $f(x)=ab^x$, where $x = 0, 1, 2, 3, \dots$</p>	<p>This concept can be found on the following pages.</p> <p>Student Edition: <i>Reading Mathematics</i> 171 Also see the additional references in <i>Glencoe Algebra 1 Chapter Resource Masters</i> on the following page. <i>Chapter 4 Resource Masters</i> 18</p>
<p>Recognize linear functions in real-world and mathematical situations; represent linear functions and other functions with tables, verbal descriptions, symbols and graphs; solve problems involving these functions and explain results in the original context.</p>	
<p>8.2.2.1</p> <p>Represent linear functions with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another.</p>	<p>Student Edition: 155-161, 196-202, 204-209, 213-218, 220-225, 227-233, 236-241, 253-258 <i>Graphing Calculator Lab</i> 162-163, 197, 203, 210-211, 234-235, 259 Teacher Wraparound Edition: F 156; Pre-AP 215</p>

STANDARDS	PAGE REFERENCES
<p>8.2.2.2</p> <p>Identify graphical properties of linear functions including slopes and intercepts. Know that the slope equals the rate of change, and that the y-intercept is zero when the function represents a proportional relationship.</p>	<p>Student Edition: 172-176, 187-195, 196-202, 204-209, 213-218, 220-225 <i>Algebra Lab</i> 186 <i>Graphing Calculator Lab</i> 197, 203, 210-211</p> <p>Teacher Wraparound Edition: TNT 188</p>
<p>8.2.2.3</p> <p>Identify how coefficient changes in the equation $f(x) = mx + b$ affect the graphs of linear functions. Know how to use graphing technology to examine these effects.</p>	<p>Student Edition: 196-202 <i>Graphing Calculator Lab</i> 197, 210-211</p>
<p>8.2.2.4</p> <p>Represent arithmetic sequences using equations, tables, graphs and verbal descriptions, and use them to solve problems.</p>	<p>Student Edition: 165-170</p> <p>Teacher Wraparound Edition: TNT 166</p>
<p>8.2.2.5</p> <p>Represent geometric sequences using equations, tables, graphs and verbal descriptions, and use them to solve problems.</p>	<p>Student Edition: <i>Reading Mathematics</i> 171 Also see the additional references in <i>Glencoe Algebra 1 Chapter Resource Masters</i> on the following page. <i>Chapter 4 Resource Masters</i> 18</p>
<p>Generate equivalent numerical and algebraic expressions and use algebraic properties to evaluate expressions.</p>	
<p>8.2.3.1</p> <p>Evaluate algebraic expressions, including expressions containing radicals and absolute values, at specified values of their variables.</p>	<p>Student Edition: 6-9, 10-14, 15-20, 46-52, 322-327, 528-534</p>
<p>8.2.3.2</p> <p>Justify steps in generating equivalent expressions by identifying the properties used, including the properties of algebra. Properties include the associative, commutative and distributive laws, and the order of operations, including grouping symbols.</p>	<p>Student Edition: 13 #43, 21-25, 33-37</p>

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<p>Represent real-world and mathematical situations using equations and inequalities involving linear expressions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context.</p>	
<p>8.2.4.1</p>	
<p>Use linear equations to represent situations involving a constant rate of change, including proportional and non-proportional relationships.</p>	<p>Student Edition: 155-161, 172-176, 196-202, 204-209, 213-218, 220-225, 227-233</p>
<p>8.2.4.2</p>	
<p>Solve multi-step equations in one variable. Solve for one variable in a multi-variable equation in terms of the other variables. Justify the steps by identifying the properties of equalities used.</p>	<p>Student Edition: 78-84, 85-90, 92-97, 98-103, 105-110, 111-115, 117-121, 122-128 <i>Algebra Lab</i> 77, 91 <i>Reading Mathematics</i> 116</p>
<p>8.2.4.3</p>	
<p>Express linear equations in slope-intercept, point-slope and standard forms, and convert between these forms. Given sufficient information, find an equation of a line.</p>	<p>Student Edition: 213-218, 220-225, 227-233, 236-241 <i>Algebra Lab</i> 228 <i>Graphing Calculator Lab</i> 234-235 Teacher Wraparound Edition: Pre-AP 215</p>
<p>8.2.4.4</p>	
<p>Use linear inequalities to represent relationships in various contexts.</p>	<p>Student Edition: 15-20, 294-299, 301-307, 308-313, 315-320, 322-327, 329-333, 334-339 Also see the additional references in <i>Glencoe Algebra 1 Chapter Resource Masters</i> on the following page. <i>Chapter 6 Resource Masters</i> 11</p>
<p>8.2.4.5</p>	
<p>Solve linear inequalities using properties of inequalities. Graph the solutions on a number line.</p>	<p>Student Edition: 294-299, 301-307, 308-313, 315-320, 322-327, 329-333, 334-339 <i>Algebra Lab</i> 300 <i>Graphing Calculator Lab</i> 309, 328</p>

STANDARDS	PAGE REFERENCES
<p>8.2.4.6</p> <p>Represent relationships in various contexts with equations and inequalities involving the absolute value of a linear expression. Solve such equations and inequalities and graph the solutions on a number line.</p>	<p>Student Edition: 322-327, 329-333 <i>Graphing Calculator Lab 328</i></p>
<p>8.2.4.7</p> <p>Represent relationships in various contexts using systems of linear equations. Solve systems of linear equations in two variables symbolically, graphically and numerically.</p>	<p>Student Edition: 253-258, 260-265, 266-270, 272-278, 280-284 <i>Algebra Lab 260</i> <i>Graphing Calculator Lab 259</i> <i>Spreadsheet Lab 252</i></p>
<p>8.2.4.8</p> <p>Understand that a system of linear equations may have no solution, one solution, or an infinite number of solutions. Relate the number of solutions to pairs of lines that are intersecting, parallel or identical. Check whether a pair of numbers satisfies a system of two linear equations in two unknowns by substituting the numbers into both equations.</p>	<p>Student Edition: 253-258, 260-265, 266-270, 272-278, 280-284 <i>Algebra Lab 260</i> <i>Graphing Calculator Lab 259</i> <i>Spreadsheet Lab 252</i></p>
<p>8.2.4.9</p> <p>Use the relationship between square roots and squares of a number to solve problems.</p>	<p>Student Edition: 46-51, 541-546 <i>Graphing Calculator Lab 543</i></p>
<p>Understand the concept of function, and identify important features of functions and other relations using symbolic and graphical methods.</p>	
<p>9.2.1.1</p> <p>Understand the definition of a function. Use functional notation and evaluate a function at a given point in its domain.</p>	<p>Student Edition: 149-154 Teacher Wraparound Edition: F151</p>
<p>9.2.1.2</p> <p>Distinguish between functions and other relations defined symbolically, graphically or in tabular form.</p>	<p>Student Edition: 143-148, 149-154 <i>Algebra Lab 142</i> Teacher Wraparound Edition: F 151; TNT 151</p>

STANDARDS	PAGE REFERENCES
9.2.1.3	
Find the domain of a function defined symbolically, graphically or in a real-world context.	Student Edition: 143-148, 149-154
9.2.1.4	
Obtain information and draw conclusions from graphs of functions and other relations.	Student Edition: 53-58, 143-148, 149-154 <i>Algebra Lab</i> 59
Understand the concept of function, and identify important features of functions and other relations using symbolic and graphical methods where appropriate.	
9.2.1.5	
Identify the vertex, line of symmetry and intercepts of the parabola corresponding to a quadratic function, using symbolic and graphical methods, when the function is expressed in the form $f(x) = ax^2 + bx + c$, in the form $f(x) = a(x - h)^2 + k$, or in factored form.	Student Edition: 471-477, 480-485, 486-491, 493-499 <i>Graphing Calculator Lab</i> 478-479 Teacher Wraparound Edition: F 473, 482
9.2.1.6	
Identify intercepts, zeros, maxima, minima and intervals of increase and decrease from the graph of a function.	Student Edition: 471-477, 480-485 <i>Graphing Calculator Lab</i> 478-479 Teacher Wraparound Edition: F 473, 482
9.2.1.7	
Understand the concept of an asymptote and identify asymptotes for exponential functions and reciprocals of linear functions, using symbolic and graphical methods.	This concept can be found on the following pages. Student Edition: 502-508 <i>Algebra Lab</i> 509 Teacher Wraparound Edition: TNT 503
9.2.1.8	
Make qualitative statements about the rate of change of a function, based on its graph or table of values.	Student Edition: 53-58, 187-195 (especially #3-#5 & #18-#19), 196-202, 208 #46, 217 #37, 471-477, 502-508 <i>Algebra Lab</i> 186 <i>Graphing Calculator Lab</i> 197, 210-211, 470, 478-479

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9.2.1.9	
<p>Determine how translations affect the symbolic and graphical forms of a function. Know how to use graphing technology to examine translations.</p>	<p>Student Edition: 217 #37 <i>Graphing Calculator Lab</i> 210-211, 478-479, 504 Also see the additional references in <i>Glencoe Algebra 1 Chapter Resource Masters</i> on the following pages. <i>Chapter 3 Resource Masters</i> 25 <i>Chapter 9 Resource Masters</i> 11</p>
<p>Recognize linear, quadratic, exponential and other common functions in real-world and mathematical situations; represent these functions with tables, verbal descriptions, symbols and graphs; solve problems involving these functions, and explain results in the original context.</p>	
9.2.2.1	
<p>Represent and solve problems in various contexts using linear and quadratic functions.</p>	<p>Student Edition: 78-84, 85-90, 92-97, 98-103, 105-110, 111-115, 122-128, 155-161, 204-209, 213-218, 2220-225, 227-233, 236-241, 471-477, 480-485, 486-491, 493-499 <i>Algebra Lab</i> 77, 91 <i>Graphing Calculator Lab</i> 234-235, 470</p>
9.2.2.2	
<p>Represent and solve problems in various contexts using exponential functions, such as investment growth, depreciation and population growth.</p>	<p>Student Edition: 502-508, 510-514 <i>Algebra Lab</i> 509 <i>Graphing Calculator Lab</i> 515-516</p>
9.2.2.3	
<p>Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how to use graphing technology to graph these functions.</p>	<p>Student Edition: 155-161, 204-209, 213-218, 220-225, 227-233, 471-477, 480-485, 502-508 <i>Algebra Lab</i> 509 <i>Graphing Calculator Lab</i> 197, 203, 210-211, 234-235, 470, 478-479, 504 Teacher Wraparound Edition: TNT 503</p>
9.2.2.4	
<p>Express the terms in a geometric sequence recursively and by giving an explicit (closed form) formula, and express the partial sums of a geometric series recursively.</p>	<p>See <i>Glencoe Algebra 2</i> © 2008 for the following references. Student Edition: 636-641, 643-648, 350-655, 658-661 Teacher Wraparound Edition: AE 637, 651, 660; FM 646</p>

STANDARDS	PAGE REFERENCES
<p>9.2.2.5</p> <p>Recognize and solve problems that can be modeled using finite geometric sequences and series, such as home mortgage and other compound interest examples. Know how to use spreadsheets and calculators to explore geometric sequences and series in various contexts.</p>	<p>Student Edition: 510-514</p> <p>Teacher Wraparound Edition: F511</p>
<p>9.2.2.6</p> <p>Sketch the graphs of common non-linear functions such as $f(x)=\sqrt{x}$, $f(x)= x$, $f(x)=\frac{1}{x}$, $f(x)=x^3$, and translations of these functions, such as $f(x)=\sqrt{x-2}+4$. Know how to use graphing technology to graph these functions.</p>	<p>Student Edition: 322-327</p> <p><i>Graphing Calculator Lab</i> 328, 547, 589</p> <p>Also see the additional references in <i>Glencoe Algebra 1 Chapter Resource Masters</i> on the following pages.</p> <p><i>Chapter 1 Resource Masters</i> 70</p> <p><i>Chapter 7 Resource Masters</i> 25</p>
<p>Generate equivalent algebraic expressions involving polynomials and radicals; use algebraic properties to evaluate expressions.</p>	
<p>9.2.3.1</p> <p>Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified points in their domains.</p>	<p>Student Edition: 10-14, 15-20, 322-327, 329-333, 471-477</p>
<p>9.2.3.2</p> <p>Add, subtract and multiply polynomials; divide a polynomial by a polynomial of equal or lower degree.</p>	<p>Student Edition: 384-388, 390-395, 398-403, 404-409, 601-606</p> <p><i>Algebra Lab</i> 375, 382-383, 396-397, 602</p>
<p>9.2.3.3</p> <p>Factor common monomial factors from polynomials, factor quadratic polynomials, and factor the difference of two squares.</p>	<p>Student Edition: 426-431, 434-439, 441-446, 447-452, 454-460, 583-588, 590-594, 595-599</p> <p><i>Algebra Lab</i> 425, 432-433, 441, 447</p>
<p>9.2.3.4</p> <p>Add, subtract, multiply, divide and simplify algebraic fractions.</p>	<p>Student Edition: 583-588, 590-594, 595-599, 601-606, 608-613, 614-619, 620-625</p> <p><i>Algebra Lab</i> 602</p>

STANDARDS	PAGE REFERENCES
<p>9.2.3.5</p> <p>Check whether a given complex number is a solution of a quadratic equation by substituting it for the variable and evaluating the expression, using arithmetic with complex numbers.</p>	<p>See <i>Glencoe Algebra 2</i> © 2008 for the following references.</p> <p>Student Edition: 272 Example 6, 273 #36-#39, 278-279 Example 4, 281 #23-#24, 282 #51, 283 #35-#36, #39</p> <p>Teacher Wraparound Edition: AE 272, 278, 280</p>
<p>9.2.3.6</p> <p>Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving n^{th} roots.</p>	<p>Student Edition: 358-364, 366-373</p> <p><i>Graphing Calculator Lab</i> 367, 535</p> <p>Also see the additional references in <i>Glencoe Algebra 1 Chapter Resource Masters</i> on the following pages.</p> <p><i>Chapter 7 Resource Masters</i> 18 <i>Chapter 9 Resource Masters</i> 18</p>
<p>9.2.3.7</p> <p>Justify steps in generating equivalent expressions by identifying the properties used. Use substitution to check the equality of expressions for some particular values of the variables; recognize that checking with substitution does not guarantee equality of expressions for all values of the variables.</p>	<p>The following references can be integrated in the classroom to meet this standard.</p> <p>Student Edition: 384-388, 390-395, 398-403, 404-409, 528-534, 536-540</p>
<p>Represent real-world and mathematical situations using equations and inequalities involving linear, quadratic, exponential, and n^{th} root functions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context</p>	
<p>9.2.4.1</p> <p>Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities.</p>	<p>Student Edition: 471-477, 480-485, 486-491 (especially Ex4), 493-499</p> <p><i>Algebra Lab</i> 500-501</p> <p><i>Graphing Calculator Lab</i> 470, 478-479</p>

STANDARDS	PAGE REFERENCES
<p>9.2.4.2</p> <p>Represent relationships in various contexts using equations involving exponential functions; solve these equations graphically or numerically. Know how to use calculators, graphing utilities or other technology to solve these equations.</p>	<p>Student Edition: 502-508, 510-514 <i>Algebra Lab</i> 509 <i>Graphing Calculator Lab</i> 504, 515-516</p>
<p>9.2.4.3</p> <p>Recognize that to solve certain equations, number systems need to be extended from whole numbers to integers, from integers to rational numbers, from rational numbers to real numbers, and from real numbers to complex numbers. In particular, non-real complex numbers are needed to solve some quadratic equations with real coefficients.</p>	<p>Student Edition: 46-52, 98-103, 122-128, 480-485 (especially Ex3), 486-491, 493-499, 528-534</p>
<p>9.2.4.4</p> <p>Represent relationships in various contexts using systems of linear inequalities; solve them graphically. Indicate which parts of the boundary are included in and excluded from the solution set using solid and dotted lines.</p>	<p>Student Edition: 341-345 <i>Graphing Calculator Lab</i> 342 Teacher Wraparound Edition: Pre-AP 345</p>
<p>9.2.4.5</p> <p>Solve linear programming problems in two variables using graphical methods.</p>	<p>See <i>Glencoe Algebra 2</i> © 2008 for the following references. Student Edition: 138-144, 152 #35, 164 337, 200 349 <i>Study Guide and Review</i> 155 3-4 Teacher Wraparound Edition: AE 139, 140</p>
<p>Represent real-world and mathematical situations using equations and inequalities involving linear, quadratic, exponential and nth root functions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context.</p>	
<p>9.2.4.6</p> <p>Represent relationships in various contexts using absolute value inequalities in two variables; solve them graphically.</p>	<p>The following references can be integrated in the classroom to meet this standard. Student Edition: 322-327</p>
<p>9.2.4.7</p> <p>Solve equations that contain radical expressions. Recognize that extraneous solutions may arise when using symbolic methods.</p>	<p>Student Edition: 541-546 <i>Graphing Calculator Lab</i> 543</p>

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<p>9.2.4.8</p> <p>Assess the reasonableness of a solution in its given context and compare the solution to appropriate graphical or numerical estimates; interpret a solution in the original context.</p>	<p>Student Edition: 215 Ex3, 216 Ex4, 264 #28, 283 #18, 312 #36, 480-485, 488 Ex4, 592 #23</p>