

**Prentice Hall Mathematics, Algebra 1 © 2009**  
**Correlated to:**  
**Montana Standards for Mathematics, Grade 10**

<b>MONTANA STANDARDS FOR MATHEMATICS</b>	<b>PRENTICE HALL MATHEMATICS, ALGEBRA 1 © 2009</b>
<b>Mathematics Content Standard 1</b>	
<b>Students engage in the mathematical processes of problem solving and reasoning, estimation, communication, connections and applications, and using appropriate technology.</b>	
<b><u>Rationale</u></b>	
<i>These processes are essential to all mathematics and must be incorporated in all other mathematics standards.</i>	
<b><u>Benchmarks</u></b>	
Students will: <b>Upon Graduation—End of Grade 12</b>	
1. recognize and formulate problems from situations within and outside mathematics and apply solution strategies to those problems.	<b>SE/TE:</b> Found throughout the text. See, for example: 71, 122-124, 151-154, 184-187, 260-261, 324-327, 340-341, 383-386, 462, 553, 555-556, 560-562, 632-633, 674-675, 702-705
2. select, apply, and evaluate appropriate estimation strategies throughout the problem-solving process.	<b>SE/TE:</b> 38, 124, 215, 224, 261, 266, 314, 355, 385, 481, 483, 486, 561, 645, 654, 757
3. formulate definitions, make and justify inferences, express generalizations, and communicate mathematical ideas and relationships.	<b>SE/TE:</b> Found throughout the text. See, for example: 15, 22, 26, 69, 75, 83, 89, 204, 210, 224, 334, 409, 430, 444, 447
4. apply and translate among different representations of the same problem situation or of the same mathematical concept. Model connections between problem situations that arise in disciplines other than mathematics.	<b>SE/TE:</b> Found throughout the text. See, for example: 281, 313, 324-328, 432, 436-437, 440, 443-444, 482, 568-569, 593, 602-603, 621, 633, 640, 669
5. select and use appropriate technology to enhance mathematical understanding. Appropriate technology may include, but is not limited to, paper and pencil, calculator, computer, and data collection devices.	<b>SE/TE:</b> 100, 107, 125, 218, 269, 316, 355, 358, 380, 394-395, 419, 445, 474, 571, 671
<b>Mathematics Content Standard 2</b>	
<b>Students demonstrate understanding of and an ability to use numbers and operations.</b>	
<b><u>Rationale</u></b>	
<i>An understanding of numbers and how they are used is necessary in the everyday world. Computational skills and procedures should be developed in context so the learner perceives them as tools for solving problems.</i>	
<b><u>Benchmarks</u></b>	
Students will:	
<b>Upon Graduation—End of Grade 12</b>	
1. use and understand the real number system, its operations, notations, and the various subsystems.	<b>SE/TE:</b> 17-23, 32, 37, 47, 48, 50, 56-63, 64-68, 69-76, 85, 90, 101, 106, 109-110, 112
2. use definitions and basic operations of the complex number system.	<b>SE/TE:</b> Not addressed in this text.
3. use the relationships and applications of ratio, proportion, percent, and scientific notation.	<b>SE/TE:</b> 142-148, 149-155, 156-157, 166-167, 168-173, 174, 180, 192-193, 194, 436-440, 442-446, 449-452, 454, 456-459, 465

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4. develop and apply number theory concepts (e.g., primes, factors and multiples) in real-world and mathematical problem situations.	<b>SE/TE:</b> 519, 688, 754, 755, 756
<b>Mathematics Content Standard 3</b>	
<b>Students use algebraic concepts, processes, and language to model and solve a variety of real-world and mathematical problems.</b>	
<b><u>Rationale</u></b>	
<i>Algebra is the language of mathematics and science. Through the use of variables and operations, algebra allows students to form abstract models from contextual information.</i>	
<b><u>Benchmarks</u></b>	
Students will:	
<b>Upon Graduation—End of Grade 12</b>	
1. use algebra to represent patterns of change.	<b>SE/TE:</b> 6-8, 23, 27-30, 32, 37, 50, 54, 116, 283, 315, 321-323, 324-328, 338-341, 366, 735
2. use basic operations with algebraic expressions.	<b>SE/TE:</b> 496-499, 500-503, 504, 505-510, 511, 512-517, 523, 528, 533, 534, 541-542, 544, 548, 556, 740-741
3. solve algebraic equations and inequalities: linear, quadratic, exponential, logarithmic, and power.	<b>SE/TE:</b> 118, 119-124, 125, 126-132, 133, 134-139, 191-192, 194, 206-211, 212-217, 219-225, 472, 565-570, 572-576, 580-584
4. solve systems of algebraic equations and inequalities, including use of matrices.	<b>SE/TE:</b> 374-379, 380, 381, 382-386, 387-393, 395, 396-402, 403, 410, 411-418, 419, 421-423, 424, 435, 736-737
5. use algebraic models to solve mathematical and real-world problems.	<b>SE/TE:</b> <i>Found throughout the text. See, for example:</i> 120-124, 127, 129-132, 135, 137, 375, 377-379, 383-384, 386, 388-389, 391-392, 396-402, 403, 413-418, 422
<b>Mathematics Content Standard 4</b>	
<b>Students demonstrate understanding of shape and an ability to use geometry. <u>Rationale</u></b>	
<i>The study of geometry helps students represent and make sense of the world by discovering relationships and developing spatial sense.</i>	
<b><u>Benchmarks</u></b>	
Students will:	
<b>Upon Graduation—End of Grade 12</b>	
1. construct, interpret, and draw three-dimensional objects.	
2. classify figures in terms of congruence and similarity and apply these relationships.	<b>SE/TE:</b> 149-155, 156-157, 192, 247
3. translate between synthetic and coordinate representations.	<b>SE/TE:</b> <i>Opportunities to address this standard can be found on the following pages:</i> 24-25
4. deduce properties of figures using transformations, coordinates, and vectors in problem solving.	<b>SE/TE:</b> <i>Opportunities to address this standard can be found on the following pages:</i> 766, 767, 768
5. apply trigonometric ratios (sine, cosine and tangent) to problem situations involving triangles.	<b>SE/TE:</b> 646-649, 650-653, 657, 658, 744-745

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<b>MONTANA STANDARDS FOR MATHEMATICS</b>	<b>PRENTICE HALL MATHEMATICS, ALGEBRA 1 © 2009</b>
<b>Mathematics Content Standard 5</b>	
<b>Students demonstrate understanding of measurable attributes and an ability to use measurement processes.</b>	
<b><u>Rationale</u></b>	
<i>The first step in scientific investigation is understanding the measurable attributes of objects.</i>	
<b><u>Benchmarks</u></b>	
Students will:	
<b>Upon Graduation—End of Grade 12</b>	
1. apply concepts of indirect measurements (e.g., using similar triangles to calculate a distance).	<b>SE/TE:</b> 151-152, 154-155, 182, 184-186, 188, 194, 729
2. use dimensional analysis to check reasonableness of procedures.	<b>SE/TE:</b> 143
3. investigate systems of derived measures (e.g., km/sec, g/cm <sup>3</sup> ).	<b>SE/TE:</b> 143, 145-148, 195
4. apply the appropriate concepts of estimates in measurement, error in measurement, tolerance, and precision.	<b>SE/TE:</b> 169-173, 174, 180, 193
<b>Mathematics Content Standard 6</b>	
<b>The students demonstrate understanding of and an ability to use data analysis, probability, and statistics.</b>	
<b><u>Rationale</u></b>	
<i>With society's expanding use of data for prediction and decision making, it is important that students develop an understanding of the concepts and processes used in analyzing data.</i>	
<b><u>Benchmarks</u></b>	
Students will:	
<b>Upon Graduation—End of Grade 12</b>	
1. use curve fitting to make predictions from data.	<b>SE/TE:</b> 350, 354-356, 357, 367, 368, 435, 533, 547, 602-603
2. apply measures of central tendency and demonstrate understanding of the concepts of variability and correlation.	<b>SE/TE:</b> 34-37, 40-45, 49, 50, 99, 113, 205, 262, 614, 636-637, 724-725
3. select an appropriate sampling method for a given statistical analysis.	<b>SE/TE:</b> 426-427
4. use experimental probability, theoretical probability, and simulation methods to represent and solve problems, including expected values.	<b>SE/TE:</b> 92, 93-99, 100, 101-106, 107, 110-111, 112, 113, 187, 196-197, 256, 335, 393, 408, 726-727
5. design a statistical experiment to study a problem and communicate the outcomes.	<b>SE/TE:</b> 100
6. describe, in general terms, the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.	

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<b>Mathematics Content Standard 7</b>	
<b>Students demonstrate understanding of and an ability to use patterns, relations and functions.</b>	
<b><u>Rationale</u></b>	
<i>One of the central themes of mathematics is the study of patterns, relations, and functions. Exploring patterns helps students develop mathematical power and instills in them an appreciation for the beauty of mathematics.</i>	
<b><u>Benchmarks</u></b>	
Students will:	
<b>Upon Graduation—End of Grade 12</b>	
1. describe functions and their inverses using graphical, numerical, physical, algebraic, and verbal mathematical models or representations.	<b>SE/TE:</b> 263-268, 270-275, 276, 302, 360-363, 469-473, 478-482, 487, 558, 560-563, 605, 607-608, 610, 611, 664-670
2. analyze the graphs of the families of polynomial, rational, power, exponential, logarithmic, and periodic functions.	<b>SE/TE:</b> 471-472, 665-666, 668-670, 676, 715, 718, 721, 746
3. analyze the effects of parameter changes on the graphs of functions and relations, including translations.	<b>SE/TE:</b> 316, 359-363, 367, 368, 550, 552-556, 639-643, 669, 671, 676, 697, 734, 742
4. model real-world phenomena with a variety of functions.	<b>SE/TE:</b> 266, 271-274, 276, 279, 281-283, 300, 302, 315, 321-323, 324-328, 332-335, 340-341, 471, 473, 478-482
5. use graphing for parametric equations, three-dimensional equations, and recursive relations.	<b>SE/TE:</b> <i>Not addressed in this text.</i>
<b>Mathematics Performance Standards: A Profile of Four Levels</b>	
<b>The Mathematics Performance Standards describe students' knowledge, skills, and abilities in the mathematics content area on a continuum from kindergarten through grade twelve. These descriptions provide a picture or profile of student achievement at the four performance levels: advanced, proficient, nearing proficiency, and novice.</b>	
<b><u>Upon Graduation Mathematics</u></b>	
<b>Advanced</b> A graduating student at the advanced level in mathematics demonstrates superior performance. He/she:	
(a) is self-motivated, an independent learner, and extends and connects ideas;	<b>SE/TE:</b> <i>Found throughout the text. See, for example:</i> 16, 91, 174, 226, 276, 316, 329, 403, 483, 511, 571, 591, 635, 671, 698
(b) is accurate, articulate, and effective when applying mathematical processes;	<b>SE/TE:</b> <i>Found throughout the text. See, for example:</i> 40-45, 79-85, 119-124, 181-187, 219-225, 235-240, 374-379, 382-386, 387-393, 396-402, 475-482, 519-523, 524-527, 565-570, 572-576
(c) effectively uses multiple strategies, extends concepts to new situations, and skillfully communicates the results;	<b>SE/TE:</b> <i>Found throughout the text. See, for example:</i> 16, 91, 174, 226, 276, 329, 403, 483, 511, 591, 635, 698
(d) explores hypothetical questions, uses complex reasoning to articulate valid arguments, and constructs proofs;	<b>SE/TE:</b> 15, 22, 75, 83, 89, 267, 409, 444, 472, 502, 516, 522, 627, 704

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(e) uses appropriate technology to apply functions, graphs, and algebraic concepts to solve real and theoretical problems;	<b>SE/TE:</b> 77, 100, 107, 125, 218, 269, 316, 358, 394-395, 419, 445, 474, 671
(f) applies complex measurement and geometric and algebraic relationships to model a variety of problems and situations;	<b>SE/TE:</b> 151-155, 182-187, 188, 194, 354, 383-384, 386, 409, 413, 415, 650-653, 657, 658, 729, 744-745
(g) consistently makes accurate and reasonable predictions and decisions based on data, probability, and statistics; and	<b>SE/TE:</b> 26, 31, 34, 36, 38, 44, 95-96, 98-99, 105, 350, 354-356, 357, 367, 368
(h) recognizes interconnections within and outside mathematics.	<b>SE/TE:</b> <i>Found throughout the text. See, for example:</i> 8, 179, 183-185, 228, 281, 313, 327, 400, 432, 471, 482, 516, 600, 669, 697
<b>Proficient</b> A graduating student at the proficient level in mathematics demonstrates solid academic performance. He/she:	
(a) consistently applies mathematical processes correctly to solve a variety of problems and communicate the results;	<b>SE/TE:</b> <i>Found throughout the text. See, for example:</i> 40-45, 79-85, 119-124, 181-187, 219-225, 235-240, 374-379, 382-386, 387-393, 396-402, 475-482, 519-523, 524-527, 565-570, 572-576
(b) applies mathematics in a variety of contexts;	<b>SE/TE:</b> <i>Found throughout the text. See, for example:</i> 8, 179, 183-185, 228, 281, 313, 327, 400, 432, 471, 482, 516, 600, 669, 697
(c) consistently uses appropriate technology to apply functions, graphs, and algebraic concepts to solve real and theoretical problems;	<b>SE/TE:</b> 77, 100, 107, 125, 218, 269, 316, 358, 394-395, 419, 445, 474, 671
(d) uses complex reasoning to formulate logical arguments and proofs using appropriate mathematical ideas;	<b>SE/TE:</b> 15, 22, 75, 83, 89, 267, 409, 444, 472, 502, 516, 522, 627, 704
(e) consistently applies complex measurement and geometric and algebraic relationships to model a variety of problems and situations;	<b>SE/TE:</b> <i>Found throughout the text. See, for example:</i> 151-155, 182-187, 188, 194, 354, 383-384, 386, 409, 413, 415, 650-653, 657, 658, 729, 744-745
(f) makes reasonable predictions and decisions based on data, probability, and statistics; and	<b>SE/TE:</b> 26, 31, 34, 36, 38, 44, 95-96, 98-99, 105, 350, 354-356, 357, 367, 368
(g) recognizes interconnections within and outside mathematics.	<b>SE/TE:</b> <i>Found throughout the text. See, for example:</i> 8, 179, 183-185, 228, 281, 313, 327, 400, 432, 471, 482, 516, 600, 669, 697
<b>Nearing Proficiency</b> A graduating student at the nearing proficiency level in mathematics demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficient-level mathematics. He/she:	
(a) applies incomplete and incorrect mathematical processes to solve problems, often inaccurately;	<b>SE/TE:</b> <i>This proficiency level could be observed on the following pages:</i> 40-45, 79-85, 119-124, 181-187, 219-225, 235-240, 374-379, 382-386, 387-393, 396-402, 475-482, 519-523, 524-527, 565-570, 572-576
(b) communicates mathematical ideas and sometimes extends them, but often inaccurately;	<b>SE/TE:</b> <i>This proficiency level could be observed on the following pages:</i> 16, 91, 174, 226, 276, 329, 403, 483, 511, 591, 635, 698

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(c) sometimes understands and uses appropriate technology to apply functions, graphs, and algebraic concepts to solve real and theoretical problems;	<b>SE/TE:</b> <i>This proficiency level could be observed on the following pages: 77, 100, 107, 125, 218, 269, 316, 358, 394-395, 419, 445, 474, 671</i>
(d) sometimes demonstrates difficulty recognizing complex measurement and geometric and algebraic relationships which result in inaccuracies;	<b>SE/TE:</b> <i>This proficiency level could be observed on the following pages: 151-155, 182-187, 188, 194, 354, 383-384, 386, 409, 413, 415, 650-653, 657, 658, 729, 744-745</i>
(e) sometimes makes predictions and decisions based on data, probability, and statistics, often inaccurately; and	<b>SE/TE:</b> <i>This proficiency level could be observed on the following pages: 26, 31, 34, 36, 38, 44, 95-96, 98-99, 105, 350, 354-356, 357, 367, 368</i>
(f) makes connections, but does not generalize or prove them and often his/her arguments lack appropriate supporting mathematical ideas and careful reasoning.	<b>SE/TE:</b> <i>This proficiency level could be observed on the following pages: 15, 22, 75, 83, 89, 267, 409, 444, 472, 502, 516, 522, 627, 704</i>
<b>Novice</b> A graduating student at the novice level in mathematics is beginning to attain the prerequisite knowledge and skills that are fundamental at each benchmark in mathematics. He/she:	
(a) demonstrates limited and incomplete use of mathematical processes and problem-solving strategies;	<b>SE/TE:</b> <i>This proficiency level could be observed on the following pages: 40-45, 79-85, 119-124, 181-187, 219-225, 235-240, 374-379, 382-386, 387-393, 396-402, 475-482, 519-523, 524-527, 565-570, 572-576</i>
(b) often uses limited and incomplete reasoning to formulate logical arguments and communicate mathematical ideas;	<b>SE/TE:</b> <i>This proficiency level could be observed on the following pages: 15, 22, 75, 83, 89, 267, 409, 444, 472, 502, 516, 522, 627, 704</i>
(c) makes only concrete, mathematical connections;	<b>SE/TE:</b> <i>This proficiency level could be observed on the following pages: 64, 78, 119, 133, 219, 381, 504, 518, 573-574, 579</i>
(d) seldom uses appropriate technology to apply functions, graphs, and algebraic concepts to solve problems;	<b>SE/TE:</b> <i>This proficiency level could be observed on the following pages: 77, 100, 107, 125, 218, 269, 316, 358, 394-395, 419, 445, 474, 671</i>
(e) recognizes, on a limited basis, complex measurement, geometric relationships, and properties; and	<b>SE/TE:</b> <i>This proficiency level could be observed on the following pages: 151-155, 182-187, 188, 194, 354, 383-384, 386, 409, 413, 415, 650-653, 657, 658, 729, 744-745</i>
(f) makes some predictions and decisions, on a limited basis, based on data, but seldom recognizes statistical or probability concepts.	<b>SE/TE:</b> <i>This proficiency level could be observed on the following pages: 26, 31, 34, 36, 38, 44, 95-96, 98-99, 105, 350, 354-356, 357, 367, 368</i>
<b>Grade Level Expectations</b>	
<b>Grade 10</b>	
1. Selects and uses appropriate processes (e.g., estimation, multiple steps) and technologies (e.g., paper and pencil, calculator, computer, data collection devices) to solve a variety of problems within and outside mathematics and communicates the results.	<b>SE/TE:</b> <i>Found throughout the text. See, for example: 40-45, 79-85, 119-124, 181-187, 219-225, 235-240, 374-379, 382-386, 387-393, 396-402, 475-482, 519-523, 524-527, 565-570, 572-576</i>

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2. Formulates and communicates logical arguments using appropriate mathematical ideas (e.g. mathematical terms, notations, generalizations) and reasoning.	<b>SE/TE:</b> 15, 22, 75, 83, 89, 267, 409, 444, 472, 502, 516, 522, 627, 704
3. Uses real and complex numbers systems to solve mathematical problems.	<b>SE/TE:</b> 17-23, 32, 37, 47, 48, 50, 56-63, 64-68, 69-76, 85, 90, 101, 106, 109-110, 112
4. Applies functions, graphs, and algebraic concepts to solve realworld problems .	<b>SE/TE:</b> <i>Found throughout the text. See, for example:</i> 120-124, 127, 129-132, 135, 137, 271-274, 377-379, 383-384, 386, 388-389, 391-392, 396-402, 403, 413-418, 422
5. Applies geometric relationships (e.g., the Pythagorean Theorem) and properties (e.g., congruence, similarity) to model a variety of problems and situations.	<b>SE/TE:</b> 151-155, 182-187, 188, 194, 650-653, 657, 658, 729, 744-745
6. Applies complex measurement (e.g., derived measures, indirect measures) to describe and compare and contrast objects in the physical world and solve real-world problems.	<b>SE/TE:</b> 151-152, 154-155, 182, 184-186, 188, 194, 729
7. Makes reasonable predictions and decisions using data, basic probability, and statistics (e.g., tables, graphs, measures of central tendency, variability, correlation, sampling).	<b>SE/TE:</b> 26, 34, 36, 38, 44, 95-96, 98-99, 105, 350, 354-356, 357, 367, 368
8. Analyzes functions using graphical, numerical, and algebraic methods.	<b>SE/TE:</b> 318, 320, 322-323, 325-328, 329, 331, 333-335, 471-472, 665-666, 668-670, 676, 715, 718, 721, 746