



IDAHO
Mathematics Standards Grades 9 Through 12
Advanced Mathematical Concepts
***Precalculus with Applications* © 2004**

STANDARDS	PAGE REFERENCES
347. BASIC ARITHMETIC, ESTIMATION, AND ACCURATE COMPUTATIONS.	
01. Understand and use numbers.	
a. Understand and use positive and negative numbers, fractions, decimals, percentages, and scientific notations.	SE: 64 #2, 65 #3, 179 #51, 273 #6, 282 #62, 606 #46, 695 ex 1, 700 #19, 701 #68, 727 ex 2
b. Understand properties of the real number system.	SE: <i>Graphing Calculator Exploration</i> 86
c. Understand properties of roots, exponents, and logarithms.	SE: 64 ex 2, 65 #6, 124 ex 1, 125 #9, 695-703, 718-725, 726-732 TWE: EC 702 MTL 695 OEA 703
d. Use number theory concepts (divisibility rules, factors, multiples, primes) to solve problems.	SE: 77 #23, 196 #48, 221 #45, 232-233 ex 4, 805 #44, 813 #40, 814 #45, 826 #10, 828 #28, 983 #6
02. Perform computations accurately.	
a. Use the proper order of operations. Perform operations with real numbers.	SE: 12 #57, 56 #32, 64 ex 2, 65 #6, 72 #45
b. Use graphs, matrices, and sequences to represent and solve problems.	SE: 78-86, 90 ex 2, 93 #10, 101 ex 5, 102 #13, 103 #46 TWE: AIN 81, 91 MTL 78 OEA 86
03. Estimate and judge reasonableness of results.	
a. Apply number sense to every day situations.	SE: 272 ex 2, 744 #6c, 745 #14c, 747 #21d, 974 #45
348. MATHEMATICAL REASONING AND PROBLEM SOLVING.	
01. Understand and use a variety of problem-solving skills.	
a. Use a variety of methods, including common mathematical formulas, to solve problems drawn from daily life.	SE: 24 #37, 111 #26, 156 #14, 205 ex 1, 223 ex 1, 519 #35, 710 #29, 716 #17, 770 ex 6, 812 #12
02. Use reasoning skills to recognize problems and express them mathematically.	
a. Use inductive and deductive reasoning to set up a problem.	SE: 94 #25, 498 #43, 510 #40, 621 #28-#32, 724 #61, 822-828, 832 #51-#53 TWE: EC 828
b. Use logic to make mathematical proofs.	SE: 94 #25, 498 #43, 510 #40, 621 #28-#32, 724 #61, 822-828, 832 #51-#53 TWE: EC 828
c. Make and evaluate logical arguments.	SE: 13 #5, 26 #2, 87 #4, 133 #4, 284 #4, 369 #3, 378 #3, 458 #4, 641 #1-#5, 695 #3-#4

STANDARDS	PAGE REFERENCES
03. Apply appropriate technology and models to find solutions to problems.	
a. Understand the purpose and capabilities of appropriate technology.	SE: 703 #86 <i>Graphing Calculator Exploration</i> 333-334, 404, 526, 592, 685-686
b. Understand the nature and use of mathematical models.	TWE: MTL 52, 88, 107, 152, 181, 243, 251, 320, 527, 535
04. Communicate results using appropriate terminology and methods.	
a. Select the appropriate means to communicate mathematical information.	SE: 17 #3, 18 #29, 23 #4, 37 #32, 41 #2, 48 #3, 50 #27, 110 #24, 118 #22, 133 #4
394. CONCEPTS AND PRINCIPLES OF MEASUREMENT.	
01. Understand and use U.S. customary and metric measurements.	
a. Determine length, area, capacity, weight, time, and temperature, with appropriate units.	SE: 168 #46, 187 #44, 192-193 ex 5, 226 #13, 229, 318 #42, 358 #51, 510 #38, 612, 701 #68
02. Apply concepts of rates and other derived or indirect measurements.	
a. Understand equivalent units, comparable units, and conversions.	This objective is covered in Glencoe's <i>Geometry</i> on pages 730-731.
03. Apply the concepts of ratios and proportions.	
a. Understand and use proportions, ratios, and scaling.	SE: 189-196, 200 #56-#58, 248 #35, 283 #72, 284-290, 298 #54, 677 #56, 692 ex 1 TWE: EC 196 OEA 196
04. Apply dimensional analysis.	
a. Understand units and their relationship to one another and to real-world applications.	SE: 23 #11, 24 #35, 28 ex 3 TWE: OEA 25
05. Perform error analysis.	
a. Understand tolerance, precision, and their applications.	SE: Standard error of the mean can be found on pages 927-928.
b. Understand that error accumulates in a computation when there is rounding at intermediate steps.	This objective is covered in Glencoe's <i>Geometry</i> on page 19 #52-#55.
350. CONCEPTS AND LANGUAGE OF ALGEBRA.	
01. Use algebraic symbolism as a tool to represent mathematical relationships.	
a. Understand and use variables, expressions, equations, and inequalities.	SE: 27-31, 32-37, 44 #15, 51 #32, 55 #8a, 56 #30, 59 #39-#46, 124 ex 2, 125 #3 TWE: EC 37
02. Evaluate algebraic expressions.	
a. Understand and use procedures for operating on algebraic expressions.	SE: 31 #55, 37 #40, 86 #64, 96 #42, 118 #28, 145 #53, 235 #33, 312 #60
03. Solve algebraic equations and inequalities.	
a. Understand and use appropriate procedures to solve linear equations and inequalities such as $3x - 4 = 2$ or $3x - 4 > 2$.	SE: 37 #40, 86 #64, 96 #42, 118 #28, 125 #6, 235 #33, 499 #57, 542 #30
b. Use appropriate procedures to simplify and solve polynomial equations and inequalities such as $x^2 + 3x = 7$ or $x^2 + 3x \leq 7$.	SE: 19 #39, 37 #40, 168 #46, 213-221, 269 #26-#33

STANDARDS	PAGE REFERENCES
04. Solve simple linear systems of equations or inequalities.	
a. Understand and use appropriate procedures to solve simple linear systems of equations and inequalities such as $x + y = 7$, $2x + 3y = 21$ or $x + y < 7$, $2x + 3y > 21$.	SE: 67-72, 73-77, 86 #55, 96 #36, 104, 355 TWE: AIN 75 EC 72, 76 OEA 72, 77
351. CONCEPTS AND PRINCIPLES OF GEOMETRY.	
01. Apply concepts of size, shape, and spatial relationships.	
a. Understand congruence and similarity as they apply to reflection, rotation, and translation.	SE: 88-96, 535-542, 670-677
b. Understand scaling as it relates to size variations in one, two, and three-dimensional objects, while shape is maintained.	SE: 92 ex 4, 93 #14, 717 #25
02. Apply the geometry of right triangles.	
a. Understand the basic concepts of right triangle trigonometry (basic trigonometry ratios such as sine, cosine, and tangent).	SE: 284-290, 291-298, 305-312 TWE: AIN 286, 295 EC 290, 298 OEA 290, 298, 312
b. Use trigonometric ratio methods to solve problems.	SE: 284-290, 291-298, 305-312 TWE: AIN 286, 295 EC 290, 298 OEA 290, 298, 312
c. Know and apply the Pythagorean Theorem to solve real-world problems.	SE: 340 ex 1, 616 ex 2, 620 #11, 632 ex 1
03. Apply graphing in two dimensions.	
a. Understand concepts of the Cartesian Coordinate System.	SE: 20 ex 1, 32 ex 1, 121 #28-#33, 272 ex 2, 470-476, 480 #48-#51, 615-622, 640 #55, 652 #51, 688 #11-#13
b. Understand the characteristics and uses of vectors.	SE: 487 ex 3, 490 #13, 491 #40, 492 #41, 495 ex 3, 497 #13, 498 #45, 503 #11, 504 #41-#42, 508 ex 4
352. DATA ANALYSIS, PROBABILITY AND STATISTICS.	
01. Understand data analysis.	
a. Read and interpret tables, charts, and graphs (scatter plots, line graphs, 3-dimensional graphs, and pie charts).	SE: 889-896, 914 #1, 925 #20, 934 #11-#13, 937 #2, 939 #1 TWE: EC 895, 916 MTL 889
02. Collect, organize, and display data.	
a. Collect and organize data, and display the data in tables, charts, and graphs (scatter diagrams, frequency tables, bar graphs, or pie charts).	SE: 84 #49, 258-264, 270 #54-#55, 740-748, 889-896, 934 #11-#13 <i>Graphing Calculator Exploration 265-266</i> <i>Internet Project 937</i>
03. Apply simple statistical measurements.	
a. Understand basic statistical concepts including mean (average), median, mode, range, and standard deviation.	SE: 111 #33, 150 #43, 897-907, 908-917, 925 #23, 934 #14-#18, 935 #19-#22, 937 #41, 939 #9
04. Understand basic concepts of probability.	
a. Understand experimental and theoretical probability.	SE: 878 #2, 886 ex 2, 977 TWE: AIN 877 OEA 880

STANDARDS	PAGE REFERENCES
b. Distinguish between independent and dependent events.	SE: 837-845, 883 #35-#36 TWE: TT 838
c. Know that probability ranges from 0% to 100%. Understand randomness and chance.	SE: 852-858, 927 TWE: AIN 854
05. Make predictions or decisions based on data.	
a. Use appropriate technology to employ simulation techniques, curve fitting, correlation, and graphical models to make predictions or decisions based on data.	SE: 38-44, 51 #31, 60 #53, 61 #69, 145 #49, 151 #51, 258-264 TWE: AIN 40, 260 EC 44
b. Design, conduct, and interpret results of statistical experiments.	TWE: AIN 854, 877 FTC 876 OEA 880
c. Analyze the effect of biased data on statistical predictions.	SE: 927-932, 936 #36-#39 TWE: AIN 929
353. FUNCTIONS AND MATHEMATICAL MODELS.	
01. Understand the concept of functions.	
a. Solve problems that involve varying quantities with variables, expressions, equations, qualities, and absolute values.	SE: 7 ex 6, 8 ex 7, 9 #13-#14, 11 #41-#46, 47 ex 4, 142 #8-#9, 143 #20-#25
02. Represent equations, inequalities, and functions in a variety of formats.	
a. Represent a set of data in a table, as a graph, and as a mathematical relationship.	SE: 5-12, 20-25, 31 #30, 32-37, 45-51
03. Apply functions to a variety of problems.	
a. Model real-world phenomena using polynomial, rational, and basic exponential functions, noting restricted domains.	SE: 38-44, 258-264, 740-748 <i>Graphing Calculator Exploration 265</i> TWE: AIN 40, 260 EC 44 FTC 39 OEA 44, 264

Codes Used for TWE Pages

AIN	Addressing Individual Needs
EC	Extra Credit
FTC	From the Classroom of...
MTL	Motivating the Lesson
OEA	Open-Ended Assessment
TT	Teaching Tip