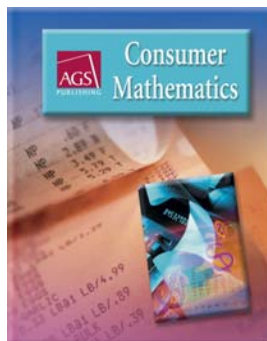


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Correlated to

Michigan Grade Level Content Expectations For High School Mathematics



5910 Rice Creek Pkwy, Suite 1000
Shoreview, MN 55126

STRAND 1: QUANTITATIVE LITERACY

STANDARD L1: REASONING ABOUT NUMBERS, SYSTEMS, AND QUANTITATIVE SITUATIONS

Based on their knowledge of the properties of arithmetic, students understand and reason about numbers, number systems, and the relationships between them. They represent quantitative relationships using mathematical symbols, and interpret relationships from those representations.

L1.1 Number Systems and Number Sense

L1.1.1 Know the different properties that hold in different number systems, and recognize that the applicable properties change in the transition from the positive integers, to all integers, to the rational numbers, and to the real numbers.

This can be found throughout the textbook.

Examples include, but are not limited to:

Pages 2, 3, 4-7, 8-9, 10-11, 15-16, 19, 20, 32, 33, 36-37, 44-45, 48-49, 52, 60, 66, 68-71, 82-83, 90-91, 96-98, 102-103, 106, 109, 116-118, 127, 130-131, 147-150, 156-157, 170-173, 186-187, 194-195, 198-199, 212-213, 220-221, 232-233, 235-237, 242, 254-255, 257-261, 353-393

L1.1.2 Explain why the multiplicative inverse of a number has the same sign as the number, while the additive inverse of a number has the opposite sign.

Can be developed from
Pages 257-261, 262

L1.1.3 Explain how the properties of associativity, commutativity, and distributivity, as well as identity and inverse elements, are used in arithmetic and algebraic calculations.

Can be developed from
Pages 1-29, 80-109, 110-137, 138-167, 168-205, 363

L1.1.4 Describe the reasons for the different effects of

This skill can be developed throughout the text. Examples

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multiplication by, or exponentiation of, a positive number by a number less than 0, a number between 0 and 1, and a number greater than 1.	<i>include, but are not limited to:</i> Pages 10-11, 12, 13-14, 17-18, 19, 20, 22-23, 61, 62, 66-67, 72-74, 75-76, 86-87, 88-89, 102-103, 104-105, 116-119, 120-121, 152-153, 176-179, 183-185, 188-190, 191-192, 193, 194-195, 198-199, 200-202, 250-251, 270-274, 306-309, 357-358
L1.1.5 Justify numerical relationships (e.g., show that the sum of even integers is even; that every integer can be written as $3m+k$, where k is 0, 1, or 2, and m is an integer; or that the sum of the first n positive integers is $n(1)/2$).	Pages 104-105, 106-107, 108, 109, 140-141, 150, 158-159, 160-161, 164-165, 166, 167
L1.1.6 Explain the importance of the irrational numbers and in basic right triangle trigonometry; the importance of π because of its role in circle relationships; and the role of e in applications such as continuously compounded interest.	Pages 270-274, 276, 334-335, 337-338
L1.2 Number Systems and Number Sense	
L1.2.1 Use mathematical symbols (e.g., interval notation, set notation, summation notation) to represent quantitative relationships and situations.	Pages 277-278, 386
L1.2.2 Interpret representations that reflect absolute value relationships (e.g. $ x - a \leq b$, or $a \pm b$) in such contexts as error tolerance.	Not applicable
L1.2.3 Use vectors to represent quantities that have magnitude and direction; interpret direction and magnitude of a vector numerically, and calculate the sum and difference of two vectors.	Not applicable
L1.2.4 Organize and summarize a data set in a table, plot, chart, or spreadsheet; find patterns in a display of data; understand and	<i>Students organize information into tables throughout the text. Examples include, but are not limited to:</i>

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critique data displays in the media.	Pages 4, 6-10, 13-14, 18-19, 21-22, 25, 43, 46, 49, 51, 52, 55, 59-60, 62, 69, 72, 74-76, 88, 90, 102, 104, 120, 126-127, 140, 145, 148, 152-157, 161, 185, 198, 212, 214, 216, 218, 220-223, 226, 229-234, 238, 240, 250, 252, 254, 258-259, 265, 272, 284-285, 297, 306, 308, 311-312, 314, 317, 331, 339, 347
L1.3 Counting and Probabilistic Reasoning	
L1.3.1 Describe, explain, and apply various counting techniques (e.g., finding the number of different 4-letter passwords; permutations; and combinations); relate combinations to Pascal's triangle; know when to use each technique.	Can be developed from: Page 253
L1.3.2 Define and interpret commonly used expressions of probability (e.g., chances of an event, likelihood, odds). .	Not applicable
L1.3.3 Recognize and explain common probability misconceptions such as "hot streaks" and "being due."	Not applicable
STANDARD L2: CALCULATION, ALGORITHMS, AND ESTIMATION	

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Students calculate fluently, estimate proficiently, and describe and use algorithms in appropriate situations (e.g., approximating solutions to equations.) They understand the basic ideas of iteration and algorithms.

L2.1 Calculation Using Real and Complex Numbers	
L2.1.1 Explain the meaning and uses of weighted averages (e.g., GNP, consumer price index, grade point average).	Can be developed from Pages 98, 123, 248-249
L2.1.2 Calculate fluently with numerical expressions involving exponents; use the rules of exponents; evaluate numerical expressions involving rational and negative exponents; transition easily between roots and exponents.	Pages 362, 363
L2.1.3 Explain the exponential relationship between a number and its base 10 logarithm, and use it to relate rules of logarithms to those of exponents in expressions involving numbers.	Not applicable
L2.1.4 Know that the complex number i is one of two solutions to $x^2 = -1$.	Not applicable
L2.1.5 Add, subtract, and multiply complex numbers; use conjugates to simplify quotients of complex numbers.	Not applicable
L2.1.6 Recognize when exact answers aren't always possible or	Pages 3, 6, 7, 13, 18, 20, 21, 35, 50-51, 60-61, 72, 82, 85, 86,

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practical; use appropriate algorithms to approximate solutions to equations (e.g., to approximate square roots).	193, 212-215, 249, 252-253, 286-291, 292-293
L2.2 Sequencing and Iteration	
L2.2.1 Find the n th term in arithmetic, geometric, or other simple sequences.	Pages 68-71, 116-118, 157, 268-269
L2.2.2 Compute sums of finite arithmetic and geometric sequences.	Pages 68-71, 73, 116-118, 157, 268-269
L2.2.3 Use iterative processes in such examples as computing compound interest or applying approximation procedures.	Pages 73, 212, 215, 270-274, 276
STANDARD L3: MEASUREMENT AND PRECISION Students apply measurement units and calculations, and understand the concept of error.	

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L3.1 Measurement Units, Calculations, and Scales	
L3.1.1 Convert units of measurement within and between systems; explain how arithmetic operations on measurements affect units, and carry units through calculations correctly.	Pages 34, 44, 45, 94, 95, 96, 122-127, 147, 176-179, 180-182, 183-185, 186-187, 188-190, 191-192, 193, 194-195, 196-197, 198-200, 200-202, 208-241, 340, 342-345, 398, 399
L3.1.2 Describe and interpret logarithmic relationships in such contexts as the Richter scale, the pH scale, or decibel measurements (e.g., explain why a small change in the scale can represent a large change in intensity); solve applied problems.	Pages 9, 34, 60, 97, 122, 158, 187, 209, 255, 286, 318, 345
L3.2 Understanding Error	
L3.2.1 Determine what degree of accuracy is reasonable for measurements in a given situation; express accuracy through use of significant digits, error tolerance, or percent of error; describe how errors in measurements are magnified by computation; recognize accumulated error in applied situations.	Pages 12, 15-16, 35, 50-51, 72, 86-87, 193
L3.2.2 Describe and explain round-off error, rounding, and truncating.	Can be developed from Pages 13-14, 15-16, 35, 50-51, 72, 86-87, 193, 286-291, 292-293
L3.2.3 Know the meaning of and interpret statistical significance, margin of error, and confidence level.	Can be developed from Pages 3, 6, 7, 13, 18, 20, 21, 35, 50-51, 60-61, 72, 82, 85, 86,

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	193, 212-215, 249, 252-253, 286-291, 292-293
STANDARD L4: MATHEMATICAL REASONING, LOGIC, AND PROOF Students understand mathematical reasoning as being grounded in logic and proof and can distinguish mathematical arguments from other types of arguments. They can interpret arguments made about quantitative situations in the popular media. Students know the language and laws of logic and can apply them in both mathematical and everyday settings. They write proofs using direct and indirect methods and use counterexamples appropriately to show that statements are false	
L4.1 Mathematical Reasoning	
L4.1.1 Distinguish between inductive and deductive reasoning, identifying and providing examples of each.	Can be developed from Pages 26, 52, 76, 106, 134, 164, 202, 242, 262, 298, 324, 348
L4.1.2 Differentiate between statistical arguments (statements verified empirically using examples or data) and logical arguments based on the rules of logic.	Pages 4, 6-10, 13-14, 18-19, 21-22, 25, 43, 46, 49, 51, 52, 55, 59-60, 62, 69, 72, 74-76, 88, 90, 102, 104, 120, 126-127, 140, 145, 148, 152-157, 161, 185, 198, 212, 214, 216, 218, 220-223, 226, 229-234, 238, 240, 250, 252, 254, 258-259, 265, 272, 284-285, 297, 306, 308, 311-312, 314, 317, 331, 339, 347
L4.1.3 Define and explain the roles of axioms (postulates), definitions, theorems, counterexamples, and proofs in the logical structure of mathematics; identify and give examples of each.	Can be developed from Pages 11, 12, 49, 69, 70, 71, 100, 101, 120, 121, 140, 141, 146, 148, 149, 154, 180, 181, 183, 184, 185, 208, 209, 210, 211, 216, 217, 253, 254, 255, 260, 261, 295, 305, 308, 309, 338, 339
L4.2 Language and Laws of Logic	
L4.2.1 Know and use the terms of basic logic (e.g., proposition,	Can be developed from Logical/Mathematical Learning Styles

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negation, truth and falsity, implication, if and only if, contrapositive, and converse).	activities Pages 19, 62, 178, 199, 226, 249, 261, 278, 298, 307, 337
L4.2.2 Use the connectives “NOT,” “AND,” “OR,” and “IF...,THEN,” in mathematical and everyday settings. Know the truth table of each connective and how to logically negate statements involving these connectives.	Can be developed from Pages 11, 12, 49, 69, 70, 71, 100, 101, 120, 121, 140, 141, 146, 148, 149, 154, 180, 181, 183, 184, 185, 208, 209, 210, 211, 216, 217, 253, 254, 255, 260, 261, 295, 305, 308, 309, 338, 339
L4.2.3 Use the quantifiers “THERE EXISTS” and “ALL” in mathematical and everyday settings and know how to logically negate statements involving them.	Can be developed from Pages 11, 12, 49, 69, 70, 71, 100, 101, 120, 121, 140, 141, 146, 148, 149, 154, 180, 181, 183, 184, 185, 208, 209, 210, 211, 216, 217, 253, 254, 255, 260, 261, 295, 305, 308, 309, 338, 339
L4.2.4 Write the converse, inverse, and contrapositive of an “If..., then...” statement; use the fact, in mathematical and everyday settings, that the contrapositive is logically equivalent to the original while the inverse and converse are not.	Can be developed from Pages 11, 12, 49, 69, 70, 71, 100, 101, 120, 121, 140, 141, 146, 148, 149, 154, 180, 181, 183, 184, 185, 208, 209, 210, 211, 216, 217, 253, 254, 255, 260, 261, 295, 305, 308, 309, 338, 339
L4.2 Proof	
Not applicable	

STRAND 2: ALGEBRA AND FUNCTIONS
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*Note: Page references are based on student text. Additional activities are available in the student workbook and teacher's resource library.

Not formally covered in this text. Basic algebraic concepts are introduced on the following pages:
 Pages 19-20, 44-45, 61-62, 73-74, 76, 86-93, 104-106, 116-117, 126, 129, 132-134, 142-146, 151, 155, 170-173, 220-231, 242, 248-262, 268-276, 291-293, 306-310, 319-323, 334-341, 344-348

STRAND 3: GEOMETRY AND TRIGONOMETRY

STANDARD G1: TWO-DIMENSIONAL FIGURES AND THEIR PROPERTIES
 Students represent discrete geometric figures, polygons, and conic sections and apply their properties in solving problems and justifying arguments. Advanced students use polar coordinates and parametric equations and their properties.

G1.1 Discrete Geometric Figures

Not applicable

G1.2 Lines and Angles

Not applicable

G1.3 Triangles and Trigonometry

Not applicable

G1.4 Quadrilaterals and Their Properties

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*Note: Page references are based on student text. Additional activities are available in the student workbook and teacher's resource library.	
G1.4.1 Solve multi-step problems and construct proofs involving angle measure, side length, diagonal length, perimeter, and area of squares, rectangles, parallelograms, kites, and trapezoids	Pages 176-179, 180-182, 186-187, 188-190, 193, 194-195, 196-197, 198-199, 200-202
G1.4.2 Solve multi-step problems and construct proofs involving quadrilaterals (e.g., prove that the diagonals of a rhombus are perpendicular) using Euclidean methods or coordinate geometry.	Pages 176-179, 180-182, 186-187, 188-190, 193, 194-195, 196-197, 198-199, 200-202, 344-345
G1.4.3 Describe and justify hierarchical relationships among quadrilaterals, (e.g. every rectangle is a parallelogram).	Can be developed from Pages 176-179, 180-182, 186-187, 188-190, 193, 194-195, 196-197, 198-199, 200-202, 344-345
G1.4.4 Prove theorems about the interior and exterior angle sums of a quadrilateral.	Not applicable
G1.5 Other Polygons and Their Properties	
G1.5.1 Know and use subdivision or circumscription methods to find areas of polygons (e.g., regular octagon, non-regular pentagon).	Pages 178-179, 186, 188-189
G1.5.2 Know, justify, and use formulas for the perimeter and area of a regular n -gon and formulas to find interior and exterior angles of a regular n -gon and their sums.	Can be developed from Pages 177, 178-179, 186, 188-189, 200-201
G1.6 Circles and Their Properties	

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*Note: Page references are based on student text. Additional activities are available in the student workbook and teacher's resource library.	
Not applicable	
G1.7 Conic Sections and Their Properties	
Not applicable	
G1.8 Three-Dimensional Figures	
Not applicable	
STANDARD G2: RELATIONSHIPS BETWEEN FIGURES Students use and justify relationships between lines, angles, area and volume formulas, and 2- and 3-dimensional representations. They solve problems and provide proofs about congruence and similarity.	
Not applicable	
STANDARD G3: TRANSFORMATIONS OF FIGURES IN THE PLANE Students will solve problems about distance-preserving transformations and shape-preserving transformations. The transformations will be described synthetically and, in simple cases, by analytic expressions in coordinates.	
Not applicable	
STRAND 4: STATISTICS AND PROBABILITY	

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*Note: Page references are based on student text. Additional activities are available in the student workbook and teacher's resource library.

STANDARD S1: UNIVARIATIVE DATA- EXAMINING DISTRIBUTIONS Students plot and analyze univariate data by considering the shape of distributions and analyzing outliers; they find and interpret commonly-used measures of center and variation; and they explain and use properties of the normal distribution.	
S.1.1 Producing and Interpreting Plots	
S1.1.1 Construct and interpret dot plots, histograms, relative frequency histograms, bar graphs, basic control charts, and box plots with appropriate labels and scales; determine which kinds of plots are appropriate for different types of data; compare data sets and interpret differences based on graphs and summary statistics.	Pages 69-71, 102-103, 141-142, 147-149, 154, 156, 248, 250-257, 272-273, 306-309
S1.1.2 Given a distribution of a variable in a data set, describe its shape, including symmetry or skewness, and state how the shape is related to measures of center (mean and median) and measures of variation (range and standard deviation) with particular attention to the effects of outliers on these measures.	Pages 141-142, 154, 156, 250, 306-309
S.1.2 Measures of Center and Variation	
S1.2.1 Calculate and interpret measures of center including: mean, median, and mode; explain uses, advantages and disadvantages of each measure given a particular set of data and its context.	Pages 98, 123, 248-249
S1.2.2 Estimate the position of the mean, median, and mode in both symmetrical and skewed distributions, and from a frequency distribution or histogram.	Can be developed from Pages 96-98, 123, 248-249

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S1.2.3 Compute and interpret measures of variation, including percentiles, quartiles, interquartile range, variance, and standard	Not applicable
S.1.3 The Normal Distribution	
Not applicable	
STANDARD S2: BIVARIATIVE DATA- EXAMINING RELATIONSHIPS Students plot and interpret bivariate data by constructing scatterplots, recognizing linear and nonlinear patterns, and interpreting correlation coefficients; they fit and interpret regression models, using technology as appropriate.	
Not applicable	
STANDARD S3: SAMPLES, SURVEYS, AND EXPERIMENTS Students understand and apply sampling and various sampling methods, examine surveys and experiments, identify bias in methods of conducting surveys, and learn strategies to minimize bias. They understand basic principals of good experimental design.	
S3.1 Data Collection and Analysis	
S3.1.1 Know the meaning of a sample from a population and a census of a population, and distinguish between sample statistics and population parameters.	Can be developed from Pages 69-71, 102-103, 141-142, 147-149, 154, 156, 248, 250-257, 272-273, 306-309
S3.1.2 Identify possible sources of bias in data collection and sampling methods and simple experiments; describe how such bias can be reduced and controlled by random sampling; explain	Can be developed from Pages 69-71, 102-103, 141-142, 147-149, 154, 156, 248, 250-257, 272-273, 306-309

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the impact of such bias on conclusions made from analysis of the data; and know the effect of replication on the precision of estimates.	
S3.1.3 Distinguish between an observational study and an experimental study, and identify, in context, the conclusions that can be drawn from each.	Can be developed from Pages 69-71, 102-103, 141-142, 147-149, 154, 156, 248, 250-257, 272-273, 306-309
STANDARD S4: PROBABILITY MODELS AND PROBABILITY CALCULATION Students understand probability and find probabilities in various situations, including those involving compound events, using diagrams, tables, geometric models and counting strategies; they apply the concepts of probability to make decisions.	
S4.1 Probability	
Not applicable	
S4.2 Application and Representation	
Not applicable	