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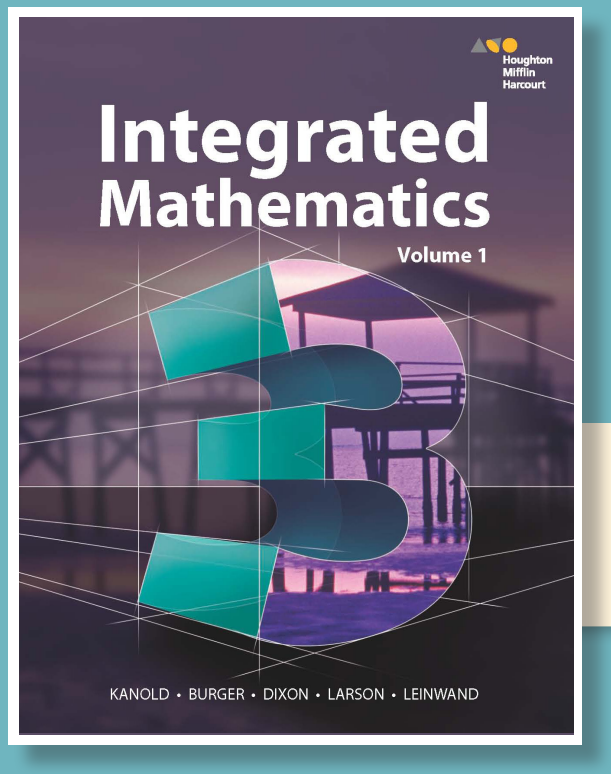

Correlation to the
Common Core State Standards for Integrated Mathematics
Mathematics 3

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correlated to the

Common Core State Standards for Mathematics
Mathematics III

Standards	Descriptor	Citations
Standards for Mathematical Practice		
SMP.1	Make sense of problems and persevere in solving them.	*Integrated throughout the book. Examples:* SE: 24, 34, 50, 114–117, 185, 197, 237, 258–260, 266
SMP.2	Reason abstractly and quantitatively.	*Integrated throughout the book. Examples:* SE: 9, 13, 18–19, 22, 30, 45, 63, 108, 143, 271, 276
SMP.3	Construct viable arguments and critique the reasoning of others.	*Integrated throughout the book. Examples:* SE: 13, 47, 65, 67, 92, 114–117, 123, 135, 291, 461, 599
SMP.4	Model with mathematics.	*Integrated throughout the book. Examples:* SE: 13, 144, 208–209, 215–224, 258–260, 270–272, 299–301, 435–436
SMP.5	Use appropriate tools strategically.	*Integrated throughout the book. Examples:* SE: 8–9, 15, 25–34, 35–36, 293–308, 343–344, 405, 452–454, 1092, 1154
SMP.6	Attend to precision.	*Integrated throughout the book. Examples:* SE: 15, 26–28, 55–56, 34, 426, 752–753, 1047, 1118–1121
SMP.7	Look for and make use of structure.	*Integrated throughout the book. Examples:* SE: 32, 42, 251–255, 279–280, 341–342, 355–356, 627–628, 641–643, 653, 938
SMP.8	Look for and express regularity in repeated reasoning.	*Integrated throughout the book. Examples:* SE: 35–36, 67, 157, 327–328, 341–344, 355–356, 627–628, 641–643

Standards	Descriptor	Citations
Standards for Mathematical Content		
N-Q	**Quantities**	
Reason quantitatively and use units to solve problems		
N-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling.	SE: 1011–1024
N-CN	**The Complex Number System**	
Use complex numbers in polynomial identities and equations.		
N-CN.B.8	(+) Extend polynomial identities to the complex numbers.	SE: 353–364
N-CN.B.9	(+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	SE: 397–412
A-SSE	**Seeing Structure in Expressions**	
Interpret the structure of expressions		
A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context.	SE: 293–308, 353–364, 445–462
A-SSE.A.1a	Interpret parts of an expression, such as terms, factors, and coefficients.	SE: 293–308, 353–364
A-SSE.A.1b	Interpret complicated expressions by viewing one or more of their parts as a single entity.	SE: 445–462
A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it.	SE: 353–364, 469–482
Write expressions in equivalent forms to solve problems		
A-SSE.B.4	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.	SE: 657–672

Standards	Descriptor	Citations
A-APR	**Arithmetic with polynomials and rational expressions**	
Perform arithmetic operations on polynomials.		
A-APR.A.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	SE: 315–326, 327–340, 341–352, 365–378
Understand the relationship between zeros and factors of polynomials.		
A-APR.B.2	Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x – a$ is $p(a)$, so $p(a) = 0$ if and only if $(x – a)$ is a factor of $p(x)$.	SE: 385–396, 397–412
A-APR.B.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	SE: 293–308, 353–364, 365–378, 385–396, 397–412
Use polynomial identities to solve problems		
A-APR.C.4	Prove polynomial identities and use them to describe numerical relationships.	SE: 327–340
A-APR.C.5	(+) Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.	SE: 341–352, 1071–1084

Standards	Descriptor	Citations
Rewrite rational expressions		
A-APR.D.6	Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.	SE: 365–378, 425–444, 445–462
A-APR.D.7	(+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	SE: 469–482, 483–496
A-CED	**Creating Equations**	
Create equations that describe numbers or relationships.		
A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems.	SE: 353–364, 497–510, 601–614
A-CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	SE: 251–266, 1011–1024
A-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.	SE: 251–266, 385–396, 497–510
A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	SE: 469–482, 483–496, 827–842

Standards	Descriptor	Citations
A-REI	**Reasoning with Equations and Inequalities**	
Understand solving equations as a process of reasoning and explain the reasoning		
A-REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	SE: 497–510, 601–614
A-REI.A.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	SE: 497–510, 601–614
Represent and solve equations and inequalities graphically		
A-REI.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.*	SE: 397–412, 1011–1024
F-IF	**Interpreting Functions**	
Interpret functions that arise in applications in terms of the context.		
F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.	SE: 293–308, 445–462, 539–556, 557–570, 959–976, 977–992, 993–1010, 1011–1024
F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	SE: 251–266

Standards	Descriptor	Citations
F-IF.B.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.⋆	SE: 539–556, 557–570
Analyze functions using different representations.		
F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.⋆	SE: 251–266, 279–292, 293–308, 397–412, 425–444, 445–462, 539–556, 557–570, 587–600, 843–856, 959–976, 977–992, 993–1010
F-IF.C.7b	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	SE: 251–266, 539–556, 557–570, 587–600
F-IF.C.7c	Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.	SE: 279–292, 293–308, 397–412
F-IF.C.7e	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	SE: 843–856, 959–976, 977–992, 993–1010
F-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	SE: 445–462, 711–724, 725–740
F-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	SE: 977–992, 993–1010

Standards	Descriptor	Citations
F-BF	**Building Functions**	
Build a function that models a relationship between two quantities.		
F-BF.A.1	Write a function that describes a relationship between two quantities.	SE: 315–326, 327–340, 483–496
F-BF.A.1b	Combine standard function types using arithmetic operations.	SE: 315–326, 327–340, 483–496
Build new functions from existing functions		
F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology.	SE: 251–266, 279–292, 425–444, 539–556, 557–570, 959–976, 977–992, 993–1010
F-BF.B.4	Find inverse functions.	SE: 267–278, 523–538
F-BF.B.4a	Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse.	SE: 523–538
F-LE	**Linear, Quadratic, and Exponential Models**	
Construct and compare linear, quadratic and exponential models and solve problems		
F-LE.A.4	For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.	SE: 843–856

Standards	Descriptor	Citations
F-TF	**Trigonometric Functions**	
Extend the domain of trigonometric functions using the unit circle.		
F-TF.A.1	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	SE: 913–926
F-TF.A.2	Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	SE: 927–940
Model periodic phenomena with trigonometric functions		
F-TF.B.5	Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.⋆	SE: 1011–1024
G-CO	**Congruence**	
Make geometric constructions.		
G-CO.D.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).	SE: 5–14, 15–24, 25–34, 125–136
G-CO.D.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	SE: 25–34

Standards	Descriptor	Citations
G-SRT	**Similarity, Right Triangles, and Trigonometry**	
Apply trigonometry to general triangles.		
G-SRT.D.9	(+) Derive the formula $A = 1/2\ ab\ \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.	SE: 869–882
G-SRT.D.10	(+) Prove the Laws of Sines and Cosines and use them to solve problems.	SE: 883–894, 895–906
G-SRT.D.11	(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	SE: 883–894, 895–906
G-C	**Circles**	
Understand and apply theorems about circles.		
G-C.A.1	Prove that all circles are similar.	SE: 1289–1298
G-C.A.2	Identify and describe relationships among inscribed angles, radii, and chords.	SE: 1205–1218, 1231–1240, 1241–1254, 1255–1268
G-C.A.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	SE: 1219–1230
G-C.A.4	(+) Construct a tangent line from a point outside a given circle to the circle.	SE: 1231–1240
Find arc lengths and areas of sectors of circles		
G-C.B.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	SE: 1289–1298, 1299–1308

Standards	Descriptor	Citations
G-GPE	**Expressing Geometric Properties with Equations**	
Translate between the geometric description and the equation for a conic section.		
G-GPE.A.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	SE: 1315–1326
G-GPE.A.2	Derive the equation of a parabola given a focus and directrix.	SE: 1327–1338
Use coordinates to prove simple geometric theorems algebraically.		
G-GPE.B.4	Use coordinates to prove simple geometric theorems algebraically.	SE: 55–68, 69–80, 81–96, 97–108, 1315–1326, 1327–1338
G-GPE.B.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	SE: 55–68, 69–80, 81–96, 97–108
G-GPE.B.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	SE: 125–136
G-GPE.B.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.⋆	SE: 81–96, 109–124, 205–214, 869–882
G-GMD	**Geometric Measurement and Dimension**	
Visualize relationships between two-dimensional and three-dimensional objects.		
G-GMD.B.4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	SE: 149–158

Standards	Descriptor	Citations
G-MG	**Modeling with Geometry**	
Apply geometric concepts in modeling situations.		
G-MG.A.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).★	SE: 159–172, 173–186, 187–198, 215–224, 215–224, 1277–1288, 1289–1298, 1299–1308
G-MG.A.2	Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).★	SE: 215–224
G-MG.A.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).★	SE: 215–224
S-ID	**Interpreting Categorical and Quantitative Data**	
Summarize, represent, and interpret data on a single count or measurement variable		
S-ID.A.4	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.	SE: 1049–1064, 1085–1094
Summarize, represent and interpret data on two categorical and quantitative variables		
S-ID.B.6a	Fit a function to the data; use functions fitted to data to solve problems in the context of the data.	SE: 1011–1024

Standards	Descriptor	Citations
S-IC	**Making Inferences and Justifying Conclusions**	
Understand and evaluate random processes underlying statistical experiments.		
S-IC.A.1	Understand statistics as a process for making inferences about population parameters based on a random sample from that population	SE: 1037–1048
S-IC.A.2	Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.	SE: 1071–1084
Make inferences and justify conclusions from sample surveys, experiments, and observational studies.		
S-IC.B.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	SE: 1133–1146
S-IC.B.4	Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.	SE: 1095–1110, 1117–1132
S-IC.B.5	Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.	SE: 1147–1164
S-IC.B.6	Evaluate reports based on data.	SE: 1133–1146
S-MD	**Using Probability to Make Decisions**	
Use probability to evaluate outcomes of decisions.		
S-MD.B.6	(+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).	SE: 1171–1180
S-MD.B.7	(+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	SE: 1181–1192