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Integrated Mathematics

1 2 3

Scope and Sequence



	Integrated Math 1	Integrated Math 2	Integrated Math 3
Number and Quantity			
The Real Number System (N–RN)			
Properties of exponents to rational exponents			
Properties of exponents		●	
Radical notation		●	
Properties of rational and irrational numbers			
Sum or product of (non-zero) rational number and irrational number		●	
Sum or product of two rational numbers		●	
Quantities (N–Q)			
Reasoning and units to solve			
Accuracy to limitation on measurement	●		◇
Data display	●		◇
Graphical display	●		◇
Interpret units in a formula	●		◇
Scale and origin in graph	●		◇
Units to solve multi-step problems	●		◇
The Complex Number System (N–CN)			
Arithmetic operations			
$a+bi$ form of a complex number, a and b real		●	
Add complex numbers		●	
Complex number i such that $i^2=-1$		●	
Conjugate of complex numbers		●	
Multiply complex numbers		●	
Subtract complex numbers		●	
Complex numbers in polynomial identities and equations			
Fundamental Theorem of Algebra		●	◇
Polynomial identities to complex numbers		●	◇
Quadratic equation with real coefficient(s) and complex solution(s)		●	
Algebra			
Seeing Structure in Expressions (A–SSE)			
Function concept and function notations			
Coefficient	●	◇	◇
Factor	●	◇	◇
Product in an expression	●	◇	◇
Rewrite an expression		●	◇
Term	●	◇	◇

	Integrated Math 1	Integrated Math 2	Integrated Math 3
Equivalent forms of expressions to solve problems			
Complete the square		●	
Equivalent form production	●	◇	
Properties of exponents: exponential function transformation	●	◇	
Properties of exponents: sum of a finite geometric series formula			●
Property of quantity explanation	●	◇	
Quadratic factoring	●	◇	
Arithmetic with Polynomials and Rational Expressions (A–APR)			
Arithmetic operations on polynomials			
Add polynomial expressions		●	◇
Multiply polynomial expressions		●	◇
Subtract polynomial expressions		●	◇
Zeros and factors of polynomials			
Factor to identify zeros			●
Graph construction			●
Remainder Theorem			●
Polynomial identities to solve problems			
Binomial Theorem			●
Polynomial identity proofs to describe numerical relationships			●
Rewrite rational expressions			
Add rational expressions			●
Computer algebra system			●
Divide rational expressions			●
Inspection			●
Long division			●
Multiply rational expressions			●
Rational expressions written in different forms			●
Subtract rational expressions			●
Create Equations (A–CED)			
Describe numbers or relationships			
Constraints by equations or inequalities	●		◇
Constraints by systems of equations or inequalities	●		◇
Equation in one variable	●	◇	◇
Equation in two or more variables	●	◇	◇
Exponential functions	●	◇	◇

	Integrated Math 1	Integrated Math 2	Integrated Math 3
Formula rearrangement to solve for a quantity of interest	●	◇	◇
Graph equations on coordinate axes	●	◇	◇
Inequality in one variable	●	◇	◇
Linear functions	●	◇	◇
Quadratic functions	●	◇	◇
Rational functions	●	◇	◇
Viable/non-viable solutions for modeling	●		◇
Reasoning with Equations and Inequalities (A–REI)			
Solving equations as a reasoning process			
Construct argument to justify solution method	●	◇	◇
Explain reasoning	●	◇	◇
Radical equation in one variable			●
Rational equation in one variable			●
Solving equations and inequalities in one variable			
Coefficients as a letter	●	◇	◇
Complex solutions		●	◇
Factorization		●	◇
Linear equation	●	◇	◇
Linear inequality	●	◇	◇
Quadratic equation: by inspection		●	◇
Quadratic equation: complete the square		●	◇
Quadratic formula		●	◇
System of equations			
Algebraic solution (exact)	●		
Graphical solution (approximate)	●		
Solution for two equations in two variables	●		
System of one linear equation and one quadratic equation		●	
System of two linear equations	●		
Graphical solutions for equations and inequalities			
Absolute value function	●		◇
Approximate solution from graph	●		◇
Exponential function	●		◇
Graph on a coordinate plane	●		◇
Intersection(s) as solution(s)	●		◇
Linear function	●		◇
Linear inequality solution as a half-plane	●		

	Integrated Math 1	Integrated Math 2	Integrated Math 3
Logarithmic function	●		◇
Polynomial function	●		◇
Rational function	●		◇
Solution set to a system of inequalities as intersection of corresponding half-planes	●		
Table of values	●		◇
Functions			
Interpreting Functions (F–IF)			
Function concept and function notations			
Element of the domain, *x*	●	◇	
Element of the range, *f(x)*	●	◇	
Function *f*	●	◇	
Function notation	●	◇	
Graph of *f* for equation *y=f(x)*	●	◇	
Output of *f* corresponds to input *x*	●	◇	
Sequence as a function	●	◇	
Applications in context			
Average rate of change	●	◇	◇
Domain as related to graph	●	◇	◇
End behavior	●	◇	◇
Graph key features	●	◇	◇
Intercepts	●	◇	◇
Interval behavior (increase, decrease)	●	◇	◇
Periodicity	●	◇	◇
Relative maximum(s) and minimum(s)	●	◇	◇
Symmetry	●	◇	◇
Table key features	●	◇	◇
Function representation by graph			
Absolute value		●	◇
Compare function represented graphically to algebraically	●	◇	◇
Cube root		●	◇
Exponent properties		●	◇
Exponential		●	◇
Exponential growth or decay		●	◇
Graph key features	●	◇	◇
Linear	●	◇	
Logarithmic		●	◇

	Integrated Math 1	Integrated Math 2	Integrated Math 3
Piecewise-defined		●	◇
Polynomial			●
Quadratic	●	◇	◇
Quadratic function expressed factored, completing the square		●	◇
Square root		●	◇
Trigonometric		●	◇
Building Functions (F–BF)			
Relationship between two quantities			
Arithmetic sequence	●		
Calculation from a context	●	◇	◇
Combine function types arithmetically	●	◇	◇
Compose function (composite)			
Explicit expression	●	◇	◇
Geometric sequence	●		
Recursive process	●		
New function from existing function			
Even function	●	◇	◇
Graph effect from change	●	◇	◇
Inverse function expression		●	◇
Odd function	●	◇	◇
Linear, Quadratic, and Exponential Models (F–LE)			
Construct and compare linear, quadratic, exponential models			
Constant percent growth or decay rate of change	●	◇	◇
Constant rate of change	●	◇	◇
Exponential function growth exceeds polynomial function growth		●	◇
Exponential model function growth		●	◇
Function construction from a graph, relationship description, input-output pairs (tables)	●	◇	◇
Linear model function growth	●	◇	◇
Parameter interpretation	●	◇	◇
Trigonometric Functions (F–TF)			
Domain from unit circle			
Counterclockwise traversal around unit circle			●
Radian measure as arc length subtended by an angle in unit circle			●
Unit circle in coordinate plane			●

	Integrated Math 1	Integrated Math 2	Integrated Math 3
Periodic phenomena			
Amplitude			●
Frequency			●
Interpret solution			●
Midline			●
Trigonometric identities			
Pythagorean identity proof		●	
Pythagorean identity to find trigonometric value		●	
Geometry			
Congruence (G–CO)			
Transformations in the plane			
Defined terms: angle, circle, perpendicular line, parallel line, line segment	●		
Definition of rotation, reflection, and translation	●		
Draw transformed figure	●		
Rotation and reflection	●		
Sequence of a transformation	●		
Transformation as a function	●		
Transformation representation	●		
Translation versus stretch	●		
Undefined terms: point, line, distance along a line, distance around a circular arc	●		
Rigid motion congruence			
Determine congruency	●		
Transform a figure	●		
Triangle congruency criteria (ASA, SAS, SSS)	●		
Prove geometric theorems			
Line and angle	●	◇	
Parallelogram	●	◇	
Triangle	●	◇	
Geometric construction			
Compass	●		◇
Equilateral triangle, square, regular hexagon inscribed in a circle	●		◇
Paper folding	●		◇
Reflective devices	●		◇
Software	●		◇
Straightedge	●		◇
String	●		◇

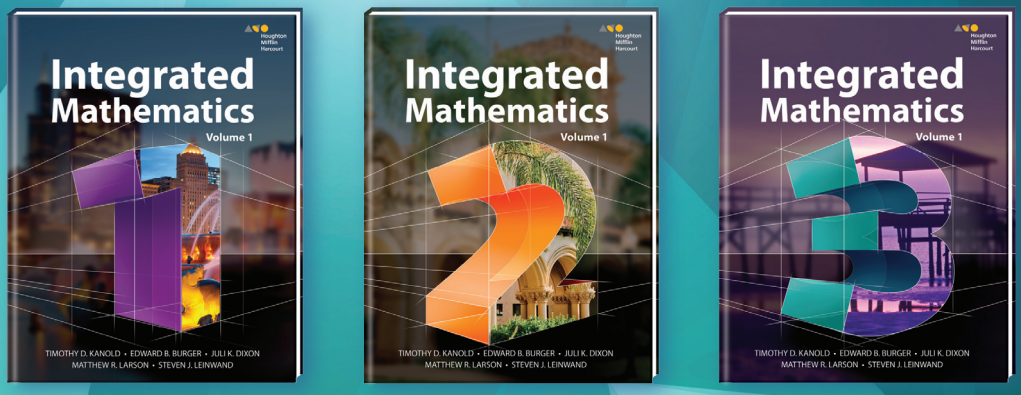
	Integrated Math 1	Integrated Math 2	Integrated Math 3
Similarity, Right Triangles, Trigonometry (G–SRT)			
Similarity transformations			
AA triangle criterion		●	
Definition of similarity		●	
Dilation given center and scale factor		●	
Similar triangles		●	
Prove similarity theorems			
Geometric figure relationships		●	
Triangles		●	
Trigonometric ratios and right triangles			
Cosine as ratio of adjacent to hypotenuse		●	
Pythagorean Theorem		●	
Sine and cosine relationship		●	
Sine as ratio of opposite to hypotenuse		●	
Solve right triangles		●	
Tangent as ratio of opposite to adjacent		●	
Trigonometric ratio definitions for acute angles		●	
Trigonometry in general triangles			
Area formula		●	◇
Law of Cosines		●	◇
Law of Sines		●	◇
Non-right triangles		●	◇
Right triangles		●	◇
Circles (G–C)			
Circle theorems			
Angles of a quadrilateral inscribed in a circle		●	◇
Chords		●	◇
Circumscribed circle in a triangle		●	◇
Inscribed angle		●	◇
Inscribed circle in a triangle		●	◇
Radii		●	◇
Similarity		●	◇
Tangent line to a circle construction		●	◇
Arc length and area of sectors			
Arc length intercepted by an angle as ratio		●	◇
Area of a sector formula		●	◇
Radian measure		●	◇

	Integrated Math 1	Integrated Math 2	Integrated Math 3
Expressing Geometric Properties with Equations (G–GPE)			
Conic section equation and geometry			
Center		●	◇
Complete the square		●	◇
Directrix		●	◇
Equation of a circle		●	◇
Equation of a parabola		●	◇
Focus		●	◇
Radius		●	◇
Algebraic proofs of geometric theorems			
Area computation, triangle and rectangle	●		◇
Coordinates	●	◇	◇
Perimeter computation, polygon	●		●
Segment partition for a given ratio		●	◇
Slope of parallel lines	●		◇
Slope of perpendicular lines	●		◇
Geometric Measurement and Dimension (G–GMD)			
Volume formulas			
Area of a circle		●	
Cavalieri's principle		●	
Circumference of a circle		●	
Problem solving		●	
Volume of a cone		●	
Volume of a cylinder		●	
Volume of a pyramid		●	
Volume of a sphere		●	
Two-dimensional and three-dimensional object relationships			
Cross-section of three-dimensional objects			●
Rotation of two-dimensional object			●
Modeling with Geometry (G–MG)			
Modeling situations			
Density based on area and volume			●
Describe objects			●
Design problem solutions			●

Statistics and Probability	Integrated Math 1	Integrated Math 2	Integrated Math 3
Interpreting Categorical and Quantitative Data (S–ID)			
Single count or measurement variable			
Box plot	●		
Compare centers and spreads of data sets	●		
Dot plot	●		
Effects of outliers	●		
Estimate area under the normal curve			●
Estimate population percentage			●
Histogram	●		
Interpret shapes, centers, and spreads of data sets	●		
Normal distribution			●
Two categorical and quantitative variables			
Fit a linear model to data	●		◇
Fit function to data (linear, quadratic, exponential)	●	◇	◇
Plot and analyze residuals	●	◇	
Recognize associations and trends	●		
Relative frequencies (joint, marginal, conditional)	●		
Scatter plot	●		
Two-way frequency table	●	◇	◇
Interpret linear models			
Correlation and causation	●		
Correlation coefficient for a linear fit	●		
Intercept (constant term)	●		
Slope (rate of change)	●		
Making Inferences and Justifying Conclusions (S–IC)			
Random processes			
Inferences about a population			●
Model consistent with results			●
Sample surveys, experiments, and observational studies			
Compare a randomized experiment			●
Evaluate a report			●
Margin of error			●
Population mean or proportion			●
Randomization			●
Simulations			●

Conditional Probability and the Rules of Probability (S–CP)	Integrated Math 1	Integrated Math 2	Integrated Math 3
Independence and conditional probability			
Conditional probability		●	
Independent and conditional probability		●	
Independent probability determination		●	
Sample space description		●	
Two-way frequency table for probability		●	
Union (or), intersection (and), complement (not)		●	
Rules of probability			
Addition Rule of probability		●	
Conditional probability of A given B as a fraction		●	
Multiplication Rule of probability		●	
Permutation and combination to compute probability of a compound event		●	
Using Probability to Make Decisions (S–MD)			
Evaluate outcomes			
Fair decision using probability		●	◇
Probability concepts for decision-making		●	◇

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