

# MATH Connections Correlation to South Carolina Standards

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*The content of those standards for grades 9–12 that are marked with an asterisk (\*) may be eligible for the Exit Examination. For information concerning specific eligibility and opportunity-to-learn relative to the Exit Examination, consult the latest edition of the mathematics blueprint developed by the Office of Assessment.*

## Process Standards Explanations

**The process standards provide the frameworks for teaching, learning, and assessing the content standards**

### Problem Solving Standard

**Instructional programs from pre-kindergarten through grade 12 should enable all students to accomplish the following**

build new mathematical knowledge through problem solving;	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
solve problems that arise in mathematics and in other contexts;	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
apply and adapt a variety of appropriate strategies to solve problems; and	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
monitor and reflect on the process of mathematical problem solving.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

### Reasoning and Proof Standard

**Instructional programs from prekindergarten through grade 12 should enable all students to accomplish the following:**

recognize reasoning and proof as fundamental aspects of mathematics;	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
make and investigate mathematical conjectures;	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
develop and evaluate mathematical arguments and proofs; and	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
select and use various types of reasoning and methods of proof.	X	XX	X	X	X	X	X	XX	XX	XX	X	XX	XX	X	X	X	X	X	X	XX	XX	XX

### Communication Standard

**Instructional programs from prekindergarten through grade 12 should enable all students to accomplish the following:**

organize and consolidate their mathematical thinking through communication;	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
communicate their mathematical thinking coherently and clearly to peers, teachers, and others;	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

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analyze and evaluate the mathematical thinking and strategies of others; and	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
use the language of mathematics to express mathematical ideas precisely.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

**Connections Standard**

**Instructional programs from prekindergarten through grade 12 should enable all students to accomplish the following:**

recognize and use connections among mathematical ideas;	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
understand how mathematical ideas interconnect and build on one another to produce a coherent whole; and	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
recognize and apply mathematics in contexts outside of mathematics.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

**Representation Standard**

**Instructional programs from prekindergarten through grade 12 should enable all students to accomplish the following:**

create and use representations to organize, record, and communicate mathematical ideas;	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
select, apply, and translate among mathematical representations to solve problems; and	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
use representations to model and interpret physical, social, and mathematical phenomena.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

**Grades 9–12: Number and Operations**

**STANDARD I. Understand numbers, ways of representing numbers, relationships among numbers, and number systems.**

**EXPECTATION**

<b>A. Develop a deeper understanding of very large and very small numbers and of various representations of them.</b>		XX				X						X							XX			XX
1. Read, write, and represent very large and very small numbers in a variety of forms including exponential and radical.		XX				X						X							XX			XX

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<b>EXPECTATION</b>																						
<b>B. Compare and contrast the properties of numbers and number systems, including the rational and real numbers, and understand complex numbers as solutions to quadratic equations that do not have real solutions.</b>		X																			X	XX
1. Identify the kinds of equations that can and cannot be solved in each subset of the complex number system.		X																			X	XX
<b>EXPECTATION</b>																						
<b>C. Understand vectors and matrices as systems that have some of the properties of the real number system.</b>														XX								
1. Use vectors to represent situations that involve both magnitude and direction, such as force, displacement, velocity, and acceleration.																						
2. Identify and use properties related to operations with matrices to justify the steps in solving problems that arise from applications.														XX					X			
<b>EXPECTATION</b>																						
<b>D. Use number-theory arguments to justify relationships involving whole numbers.</b>		XX				XX															XX	XX
*1. Use the commutative, associative, distributive, equality, and identity properties to justify the steps in solving equations and inequalities.		XX							XX		X		XX								XX	X

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*2. Use symbolic representation, reasoning, and proof to verify statements about numbers.		XX	XX			XX							XX			XX					XX	XX

**STANDARD II. Understand meanings of operations and how they relate to one another.**

**EXPECTATION**

<b>A. Judge the effects of such operations as multiplication, division, and computing powers and roots on the magnitudes of quantities.</b>	XX	XX			XX	X	X		XX	XX					X	XX						
*1. Recognize and justify the relationship between the magnitude of a number and the application of specific arithmetic operations.	XX	XX			XX	X	X		XX	XX					X	XX						XX

**EXPECTATION**

<b>B. Develop an understanding of properties of, and representations for, the addition and multiplication of vectors and matrices.</b>															XX							X
*1. Organize data and perform operations of addition, subtraction, and scalar multiplication to solve problems using matrices.															XX							X

**EXPECTATION**

<b>C. Develop an understanding of permutations and combinations as counting techniques.</b>																			XX			
1. Determine the relationship between counting when order matters and when order does not matter.							X												XX			

**STANDARD III. Compute fluently and make reasonable estimates.**

**EXPECTATION**

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<b>A. Develop fluency in operations with real numbers, vectors, and matrices, using mental computation or paper-and-pencil calculations for simple cases and technology for more complicated cases.</b>	X	XX	XX	XX	XX	X	X	X	XX	X	X	XX	XX	X	X	XX	X	X	X	X	X	XX
1. Given a problem situation, determine whether to use a rough estimate, an approximation, or an exact answer. Select a suitable method of computing from techniques such as the use of mental mathematics, paper and pencil computations, calculators, and computers.	X	XX	XX	XX	XX	X	X	X	XX	X	X	XX	XX	X	X	XX	X	X	X	X	X	XX
<b>EXPECTATION</b>																						
<b>B. Judge the reasonableness of numerical computations and their results.</b>	XX	XX	XX	XX	XX	X	X	XX	X	X	X	X	X	X	X	X	X	XX	X	X	X	
*1. Explain why a solution is mathematically reasonable using supporting data.	XX	XX	XX	XX	XX	X	X	XX	X	X	X	X	X	X	X	X	X	XX	X	X	X	
<b>Grades 9–12: Algebra</b>																						
<b>Hand-held graphing calculators are required as part of instruction and assessment. Students should use a variety of representations (concrete, numerical, algorithmic, graphical), tools (matrices, data), and technology to model mathematical situations in solving meaningful problems. Technology includes, but is not limited to, powerful and accessible hand-held calculators as well as computers with graphing capabilities.</b>																						
<b>Expectation</b>																						
<b>A. Generalize patterns using explicitly defined and recursively defined functions</b>		XX	XX	X	X	XX			X	X	XX	X	X		XX	XX	XX	X			XX	
*1. Interpret and make inferences from explicit and recursive functional relationships.	X	X	X	X	X	XX			X	X	XX	X	X		XX	XX	XX				XX	

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*2. Describe independent and dependent quantities in functional relationships.						XX									X	X	X					
*3. Use patterns to generate the laws of exponents and apply them in problem-solving situations.			XX	X		X										XX						
<b>Expectation</b>																						
<b>B. Understand relations and functions and select, convert flexibly among, and use various representations for them.</b>						XX									XX	XX	XX	X				XX
*1. Gather and record data, or use data sets, to determine functional (systematic) relationships between quantities.		X	X	X	X	XX			X	X	X	X	X	X	XX	XX	XX	XX	X	X	XX	
*2. Represent relationships among quantities using concrete models, tables, graphs, diagrams, verbal descriptions, equations, and inequalities including representations involving computer algebra systems, spreadsheets, and graphing calculators.		XX	XX	XX	XX	XX			X	X	XX	XX	X	X	XX	XX	XX	XX	X	X	XX	
*3. Interpret situations in terms of given graphs and create situations that fit given graphs.			XX	XX	XX	XX			X	X	XX	XX	XX	X	XX	XX	XX	XX	XX	X	XX	X
<b>Expectation</b>																						
<b>C. Analyze functions of one variable by investigating rates of change, intercepts, zeros, asymptotes, and local and global behavior.</b>						XX									XX	XX	XX	XX				

