

## End-of-Course Assessments Upper-Level Mathematics Tests

End-of-Course Upper-Level Mathematics tests are included in the standard Measures of Academic Progress™ (MAP) license. These tests are designed to measure specific content a student may understand in one specialty of mathematics after a year of instruction. Resulting scores provide one indicator of whether the student is ready to move to the next mathematics course in the sequence. Educators can monitor course scores from year to year to learn how the mathematics program is improving over time.

### Test Structure and Content

End-of-Course Mathematics assessments are computerized adaptive tests. NWEA currently offers five End-of-Course Mathematics tests. The goal structures for these tests are not state-specific.

- Algebra 1
- Geometry
- Algebra 2
- Integrated Mathematics 1 and 2
- Integrated Mathematics 3

### Administering the Test

End-of-Course Mathematics tests should only be given at the end of the specific course. They should never be used as a pre-test for that course.

The Mathematics Survey w/ Goals 6+ test is appropriate to give in the fall or at the beginning of an Algebra 1, Geometry, or Algebra 2 course in order to receive instructional data linked to DesCartes: A Continuum of Learning and to establish a baseline measure for growth.

If integrated mathematics courses are taught at your site, it would be appropriate to administer the Mathematics Survey w/ Goals 6+ test at the end of an Integrated Mathematics 1 course. The Integrated Mathematics 1 and 2 test is combined into one test and is designed to be used after two years of instruction; therefore, it is appropriate to give this test at the end of the Integrated Mathematics 2 course. Integrated Mathematics 3 should be administered after three years of course instruction.

For a demonstration, the End-of-Course Mathematics tests are included in the TestTaker training school.

### Growth and Norms

The overall RIT from the Mathematics Survey w/ Goals 6+ test is the best score to use for establishing an initial growth point for each student.

End-of-Course Mathematics tests currently do not have growth norms.

The **RIT Scale Norms Study** provides data on medians, means, and standard deviations for the End-of-Course Mathematics tests (shown below). We do not currently have data on Integrated Mathematics.

Mathematics Course	Medians	Means	Standard Deviations	Number of Students
Algebra 1	248	246.8	12.23	14,583
Geometry	253	251.3	14.73	4,218
Algebra 2	256	254.3	12.40	1,678

Sample was not stratified based on ethnicity or school-level percentage of free and reduced price lunches.

## Interpreting Scores

End-of-Course Mathematics tests are not considered mastery tests. Mastery implies proficiency level, which varies from state to state.

End-of-Course Mathematics test data do not inform “passing” criteria relative to state standards. NWEA is unable to define “passing” appropriate for every district using our assessments. We can, however, provide relative performance by norms.

End-of-Course Mathematics tests display a RIT range in goal areas, allowing educators to look at goal performance for students and for the class. Goal area information can inform instructional decisions and indicate whether the content of the course is addressing all goal areas. Goal area information also provides focus on the relative weaknesses and strengths of the class as a whole.

## Reports

- **Achievement Status and Growth (ASG):** End-of-Course Mathematics tests display an overall RIT on the ASG Report. Growth is calculated from the overall fall RIT on the Mathematics Survey w/ Goals 6+ test to the overall RIT on the End-of-Course Mathematics test. Please see Special Considerations for information about 11th and 12th grade growth.
- **Instructional Resources:** End-of-Course Mathematics test data display in the Class Breakdown by Overall RIT Report as well as in the Class Breakdown by Goal Report. DesCartes, however, does not link to End-of-Course assessments; therefore, it is critical to use the Mathematics Survey w/ Goals 6+ test in the fall or at the beginning of the term to inform instruction.
- **Dynamic Reporting Suite:** End-of-Course Mathematics test data display in the Dynamic Reporting Suite. In the Goal by RIT Band Report, the End-of-Course Mathematics tests are listed in the Goal Structure drop-down box. Students who take End-of-Course Mathematics tests are included in the Grade by RIT Band Report as well.
- **Growth Summary:** End-of-Course Mathematics test data display in the Growth Summary Reports. Please see special considerations for information about 11th and 12th grade growth.

## Special Considerations

- **Block Scheduling:** Secondary schools that are on a block schedule should give the End-of-Course Mathematics assessment at the end of that course. For example, a high school with block scheduling offers Algebra 1 in the fall; the End-of-Course Algebra 1 assessment should be given at the end of that course (December or January). If the Algebra 1 course is offered in the spring, the End-of-Course Algebra 1 assessment would be given at the end of that course (May or June). If instructional information is desired at the start of the course, the Mathematics Survey w/ Goals 6+ test should be administered.
- **11th and 12th Grade Growth:** Currently NWEA does not maintain beginning-of-year to end-of-year growth norms for grades 11 and 12. Until these growth norms are established, 11th and 12th grade teachers should disregard the 11th and 12th grade growth data on the Achievement Status and Growth (ASG) Report and Growth Summary Reports.

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## End-of-Course Upper-Level Mathematics Goal Structures

- Algebra 1
  - Geometry
  - Algebra 2
  - Integrated Mathematics 1 and 2
  - Integrated Mathematics 3
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### Algebra 1

1. Number Sense, Properties, and Number Theory
  - a. Number Sense: Real numbers
  - b. Properties of Real Numbers
  - c. Number Theory
2. Computation and Estimation with Real Numbers
  - a. Computation with Real Numbers
  - b. Ratio and Proportion
  - c. Estimation with Real Numbers
3. Patterns, Functions, and Graphing
  - a. Patterns: Arithmetic and geometric
  - b. Functions: Linear, quadratic, polynomial, rational, power, square root, and absolute value
  - c. Coordinate Graphing
4. Expressions
  - a. Evaluate and Simplify Expressions
  - b. Operations with Algebraic Expressions
5. Equations and Inequalities
  - a. Linear Equations
  - b. Linear Inequalities
  - c. Systems of Linear Equations and Inequalities: Algebraic and graphing methods
  - d. Non-Linear Equations: Quadratic, polynomial, rational, square root (includes Pythagorean Theorem), and absolute value

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## End-of-Course Upper-Level Mathematics Goal Structures

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- Algebra 1
  - Geometry
  - Algebra 2
  - Integrated Mathematics 1 and 2
  - Integrated Mathematics 3
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### Geometry

1. Properties of Geometric Shapes
  - a. Points, Lines, Planes, and Angles
  - b. Polygons and Circles
  - c. Three-Dimensional Figures
2. Measurement of Geometric Shapes
  - a. Perimeter and Circumference
  - b. Area and Surface Area
  - c. Volume
3. Geometric Relationships
  - a. Congruence and Similarity
  - b. Pythagorean Theorem and Right Triangle Trigonometry
  - c. Transformations and Symmetry
  - d. Coordinate Graphing and Distance

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## End-of-Course Upper-Level Mathematics Goal Structures

- Algebra 1
  - Geometry
  - Algebra 2
  - Integrated Mathematics 1 and 2
  - Integrated Mathematics 3
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### Algebra 2

1. **Number Sense, Properties, and Number Theory**
  - a. Number Sense: Complex Numbers, including logarithms and matrices
  - b. Properties of Complex Numbers
  - c. Number Theory
2. **Computation and Estimation with Real Numbers**
  - a. Computation with Complex Numbers: Including matrices and logarithms
  - b. Ratio and Proportion; Trigonometric Ratios
  - c. Estimation with Real Numbers
3. **Patterns, Functions, and Graphing**
  - a. Patterns, Sequences, and Series: Arithmetic and geometric, including recursive sequences
  - b. Functions: Linear, Quadratic, polynomial, rational, power, square root, absolute value, exponential, logarithmic, trigonometric, direct variation, and inverse variation
  - c. Coordinate Graphing
4. **Expressions**
  - a. Evaluate and Simplify Expressions: Including complex number expressions
  - b. Operations with Algebraic Expressions: Including division of polynomials by binomials
5. **Equations and Inequalities**
  - a. Linear Equations
  - b. Linear and Non-linear Inequalities
  - c. Systems of Linear Equations and Inequalities: Algebraic, graphing, and matrix methods; linear programming
  - d. Non-Linear Equations: Quadratic, polynomial, rational, square root (includes Pythagorean Theorem), absolute value, exponential, logarithmic, and trigonometric

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## End-of-Course Upper-Level Mathematics Goal Structures

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- Algebra 1
  - Geometry
  - Algebra 2
  - Integrated Mathematics 1 and 2
  - Integrated Mathematics 3
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### Integrated Mathematics 1 and 2

1. Number Sense, Properties, and Number Theory
  - a. Number Sense: Real Numbers
  - b. Properties of Real Numbers
  - c. Number Theory
2. Computation and Estimation with Real Numbers
  - a. Computation with Real Numbers
  - b. Ratio, Proportion, Percent, and Rate
  - c. Estimation with Real Numbers
3. Measurement
  - a. Perimeter and Circumference
  - b. Area and Surface Area
  - c. Volume
4. Geometry
  - a. Points, Lines, Planes, and Angles
  - b. Polygons and Circles
  - c. Three-Dimensional Figures
  - d. Congruence and Similarity
  - e. Pythagorean Theorem and Right Triangle Trigonometry
  - f. Transformations and Symmetry
  - g. Coordinate Graphing and Distance
5. Statistics and Probability
  - a. Collect and organize data; Read and interpret graphs; Analyze data
  - b. Probability
6. Algebraic Concepts
  - a. Patterns and Sequences: Arithmetic and geometric
  - b. Functions: Linear, quadratic, polynomial, rational, power, square root, absolute value, exponential, direct and inverse variation
  - c. Evaluate and Simplify Expressions
  - d. Operations with Algebraic Expressions
  - e. Linear Equations
  - f. Linear Inequalities
  - g. Systems of Linear Equations and Inequalities: Algebraic, graphing, and matrix methods
  - h. Non-Linear Equations: Quadratic, polynomial, rational, square root, and absolute value

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## End-of-Course Upper-Level Mathematics Goal Structures

- Algebra 1
  - Geometry
  - Algebra 2
  - Integrated Mathematics 1 and 2
  - Integrated Mathematics 3
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### Integrated Mathematics 3

1. Number Sense, Properties, and Number Theory
  - a. Number Sense: Real and Complex Numbers, Matrices and Logarithms
  - b. Properties of Real and Complex Numbers
  - c. Number Theory
2. Computation and Estimation with Real and Complex Numbers
  - a. Computation with Complex Numbers, Matrices and Logarithms
  - b. Ratio, Proportion, Percent, and Rate
  - c. Estimation with Real Numbers
3. Measurement
  - a. Perimeter and Circumference
  - b. Area and Surface Area
  - c. Volume
4. Geometry
  - a. Points, Lines, Planes, and Angles
  - b. Polygons and Circles
  - c. Three-Dimensional Figures
  - d. Congruence and Similarity
  - e. Pythagorean Theorem and Trigonometry: Including oblique triangle trigonometry and vectors
  - f. Transformations and Symmetry
  - g. Coordinate Graphing
5. Statistics and Probability
  - a. Collect and Organize Data; Read and Interpret Graphs; Analyze Data: Includes standard deviation, variance, percentiles
  - b. Probability and Combinatorics
6. Algebraic Concepts
  - a. Patterns, Sequences, and Series: Arithmetic and geometric, including recursive sequences and series
  - b. Functions and Relations: Linear, quadratic, polynomial, rational, power, square root, absolute value, exponential, logarithmic, direct and inverse variation, periodic; conic sections
  - c. Evaluate and Simplify Expressions: Order of operations, powers, roots, absolute value, algebraic expressions
  - d. Operations with Algebraic Expressions: Including division of polynomials by binomials
  - e. Linear Equations
  - f. Linear and Non-linear Inequalities
  - g. Systems of Linear Equations and Inequalities: Algebraic, graphing, and matrix methods; linear programming
  - h. Non-Linear Equations: Quadratic, polynomial, rational, square root, absolute value, exponential and logarithmic