THIS HANDBOOK IS FOR THE IMPLEMENTATION OF THE INTERMEDIATE ALGEBRA 2 CURRICULUM IN MOUNT VERNON CITY SCHOOL DISTRICT (MVCSD).

2016-17
Mount Vernon City School District

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The Parent Notification Policy states “Parent(s) / guardian(s) or adult students are to be notified, \emph{in writing}, at any time during a grading period when it is apparent - that the student may fail or is performing unsatisfactorily in any course or grade level. Parent(s) / guardian(s) are also to be notified, \emph{in writing}, at any time during the grading period when it becomes evident that the student's conduct or effort grades are unsatisfactory.”
VISION STATEMENT

True success comes from co-accountability and co-responsibility. In a coherent instructional system, everyone is responsible for student learning and student achievement. The question we need to constantly ask ourselves is, "How are our students doing?"

The starting point for an accountability system is a set of standards and benchmarks for student achievement. Standards work best when they are well defined and clearly communicated to students, teachers, administrators, and parents. The focus of a standards-based education system is to provide common goals and a shared vision of what it means to be educated. The purposes of a periodic assessment system are to diagnose student learning needs, guide instruction and align professional development at all levels of the system.

The primary purpose of this Instructional Guide is to provide teachers and administrators with a tool for determining what to teach and assess. More specifically, the Instructional Guide provides a "road map" and timeline for teaching and assessing the NYS Mathematics Core Curriculum.

I ask for your support in ensuring that this tool is utilized so students are able to benefit from a standards-based system where curriculum, instruction, and assessment are aligned. In this system, curriculum, instruction, and assessment are tightly interwoven to support student learning and ensure ALL students have equal access to a rigorous curriculum.

We must all accept responsibility for closing the achievement gap and improving student achievement for all of our students.

Dr. Satish Jagnandan

Administrator for Mathematics and Science (K-12)
PHILOSOPHY OF MATHEMATICS CURRICULUM

The Mount Vernon City School District recognizes that the understanding of mathematics is necessary for students to compete in today’s technological society. A developmentally appropriate mathematics curriculum will incorporate a strong conceptual knowledge of mathematics through the use of concrete experiences. To assist students in the understanding and application of mathematical concepts, the mathematics curriculum will provide learning experiences which promote communication, reasoning, and problem solving skills. Students will be better able to develop an understanding for the power of mathematics in our world today.

Students will only become successful in mathematics if they see mathematics as a whole, not as isolated skills and facts. As we develop mathematics curriculum based upon the standards, attention must be given to both content and process strands. Likewise, as teachers develop their instructional plans and their assessment techniques, they also must give attention to the integration of process and content. To do otherwise would produce students who have temporary knowledge and who are unable to apply mathematics in realistic settings. Curriculum, instruction, and assessment are intricately related and must be designed with this in mind. All three domains must address conceptual understanding, procedural fluency, and problem solving. If this is accomplished, school districts will produce students who will

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.
# ALGEBRA2 NR PACING GUIDE

This guide using AMSCO Algebra 2 and Trigonometry (© 2009) was created to provide teachers with a time frame to complete the MVCSD Algebra 2 NR Mathematics Curriculum.

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<td>The Integers</td>
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Note that the curriculum assumes that each school day includes 40-45 minutes of math. Designed to fit within the calendar of a typical school year, Algebra 2 NR includes a total of 77 aims (or approximately 39 weeks of work). This provides some leeway for going further with particular ideas and/or accommodating local circumstances. Although pacing will vary somewhat in response to variations in school calendars, needs of students, your school's years of experience with the curriculum, and other local factors, following the suggested pacing and sequence will ensure that students benefit from the way mathematical ideas are introduced, developed, and revisited across the year.
# ALGEBRA 2 NR PACING GUIDE

## I – The Integers

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<td>X</td>
<td>A.N.1</td>
<td>1-1 Whole Numbers, Integers, and the Number Line</td>
<td>2</td>
<td>#1: What is the set of real numbers (Set R) and its subsets?</td>
<td>Set, set symbol, set R and its subsets, properties of real numbers (commutative, identity, inverse, associative, distributive), roster method, descriptive method of describing a set.</td>
<td>Sept</td>
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<tr>
<td>X</td>
<td>A.N.5</td>
<td>1-2 Writing and Solving Number Sentences</td>
<td>5</td>
<td>#2: What are the properties of real number (Set R) and how are they applied in the operations with real numbers?</td>
<td>Properties of equality, equation, reflexive, symmetric, multiplicative and additive properties, transitive; inequality, order relations symbols (&lt;, &gt;, ≤, ≥)</td>
<td>Sept</td>
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<tr>
<td>A.APR.1</td>
<td>A2.N.3</td>
<td>1-3 Adding Polynomials</td>
<td>9</td>
<td>#3: What are the properties of equality/inequality and how are they applied?</td>
<td>Constant, coefficient, base, exponent, like/similar terms, unlike or dissimilar terms</td>
<td>Sept</td>
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<tr>
<td>X</td>
<td>A.2.A.1</td>
<td>1-4 Solving Absolute Value Equations and Inequalities</td>
<td>13</td>
<td>#4: How do we add polynomials?</td>
<td>Absolute value, solution, solution set</td>
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<tr>
<td>A.APR.1</td>
<td>A2.A.7</td>
<td>1-5 Multiplying Polynomials</td>
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<td>#5: How do we solve an absolute value equation or inequality?</td>
<td>Term, power, monomial, binomial, trinomial, polynomial</td>
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<tr>
<td>A.APR.1</td>
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<td>1-6 Factoring Polynomials</td>
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<td>#6: How do we multiply polynomials?</td>
<td>Common factor, greatest common factor, common monomial factor, common binomial factor, binomial factors, special products, special factors, prime polynomial</td>
<td>Sept</td>
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<tr>
<td>A.CED.1</td>
<td>A2.A.7</td>
<td>1-7 Quadratic Equations with Integral Roots</td>
<td>27</td>
<td>#7: How do we factor polynomials?</td>
<td>Quadratic equation, standard form, degree.</td>
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<td>A.CED.1</td>
<td>A2.A.4</td>
<td>1-8 Quadratic Inequalities</td>
<td>30</td>
<td>#8: How do we find the integral roots of quadratic equations?</td>
<td>Quadratic inequality</td>
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**COMMON ASSESSMENT #1**
## 2 – The Rational Numbers

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<td>A.APR.8 N.RN.1</td>
<td>A2.N.3</td>
<td>2-1 Rational Numbers</td>
<td>40</td>
<td>#10: What differentiates a rational from irrational number as subsets of set R?</td>
<td>Rational and irrational numbers, reciprocal, decimal number, terminating decimal, non-terminating repeating decimal</td>
<td>Oct</td>
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<tr>
<td>A.APR.8 N.RN.1</td>
<td>A2.N.3; A2.A.16</td>
<td>2-2 Simplifying Rational Expressions</td>
<td>44</td>
<td>#11: How are the properties of Set R applied to the set of rational numbers?</td>
<td>Rational expression, simplest form or lowest terms, canceling, numerator, denominator, product, reduction to lowest terms</td>
<td>Oct</td>
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<tr>
<td>A.APR.8</td>
<td>A2.N.3; A2.A.16</td>
<td>2-4 Adding and Subtracting Rational Expressions</td>
<td>53</td>
<td>#13: How do you multiply rational expressions? #14: How do you divide rational expressions?</td>
<td>Addend, sum, subtrahend, minuend, difference, least common denominator</td>
<td>Oct</td>
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<td>X</td>
<td>A2.A.23</td>
<td>2-5 Ratio and Proportion</td>
<td>57</td>
<td>#15: In a proportion, how do you find a missing mean or extreme?</td>
<td>Ratio, proportion, means, extremes, ratio symbols.</td>
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<tr>
<td>A.APR.8</td>
<td>A2.A.17</td>
<td>2-6 Complex Rational Expressions</td>
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<td>#16: How do you simplify a complex fraction?</td>
<td>Complex fraction, complex rational expression, least common multiple, least common denominator,</td>
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### 3 – Real Numbers and Radicals

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<td>3-1 The Real Numbers and Absolute Value</td>
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<td>#19: What are real, irrational and rational numbers and how are they arranged in a number line which can be described using an inequality?</td>
<td>Real numbers, irrational and rational numbers, absolute value, interval notation, absolute value inequality</td>
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<tr>
<td>N.RN.3</td>
<td>A2.N.1 A2.N.2 A2.N.3 A2.N.4</td>
<td>3-2 Roots and Radicals</td>
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<td>#20: How do we perform operations on irrational numbers and find its nth root?</td>
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<td>N.NR.3</td>
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<td>3-3 Simplifying Radicals</td>
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<td>N.RN.3</td>
<td>A2.A.14 A2.N.4</td>
<td>3-4 Adding and Subtracting Radicals</td>
<td>94</td>
<td>#22: How do we add or subtract radicals with both like or unlike radicands?</td>
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<td>Function, relation, one-to-one correspondence, domain, range, dependent variable, independent variable, onto, vertical line test</td>
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<td>Polynomial function, degree, parabola, turning point, vertex, axis of symmetry, direction of infinite extent, roots of polynomial function, double roots</td>
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<td>Identity function, inverse functions, absolute value function and its inverse, inverse of a quadratic function</td>
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<td>Circle, radius, diameter, standard form, radius-center form</td>
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<td>Inverse proportion or inverse variation, xy=k parabola</td>
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<td>Quadratic formula, standard form</td>
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<td>5-3 The Discriminant</td>
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<td>N.CN.3</td>
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<td>5-8 Solving Higher Degree Polynomial Equations</td>
<td>224</td>
<td>#46: How do we find the roots of higher degree polynomials?</td>
<td>Higher degree polynomials</td>
<td>Feb</td>
</tr>
<tr>
<td>A.REI.6</td>
<td>A2.A.50</td>
<td>5-9 Solutions of Systems of Equations and Inequalities</td>
<td>229</td>
<td>#47: How do we find the solutions of systems of equations?</td>
<td>Systems of equations, systems of inequalities</td>
<td>Feb</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>#48: How do we find the solutions of systems of inequalities?</td>
<td></td>
<td>Feb</td>
</tr>
</tbody>
</table>

**COMMON ASSESSMENT #5**  
Feb
# 6 – Sequences and Series

<table>
<thead>
<tr>
<th>Common Core</th>
<th>NYSPI #</th>
<th>Topic/Lesson</th>
<th>Textbook Page</th>
<th>Aim</th>
<th>Vocabulary</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>F.IF.3</td>
<td></td>
<td>6-1 Sequences</td>
<td>248</td>
<td>#49: How can we specify the terms of a sequence, given its recursive definition?</td>
<td>Sequence, finite and infinite sequence, recursive definition</td>
<td>Mar</td>
</tr>
<tr>
<td>F.BF.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F.IF.3</td>
<td></td>
<td>6-2 Arithmetic Sequences</td>
<td>252</td>
<td>#50: How do we identify an arithmetic or geometric sequence and find its nth term?</td>
<td>Arithmetic sequence, geometric sequence, nth term, common difference, common factor, arithmetic mean</td>
<td>Mar</td>
</tr>
<tr>
<td>F.BF.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
<td>6-3 Sigma Notation</td>
<td>257</td>
<td>#51: How do we find a sum using the sigma notation?</td>
<td>Sigma, series, sigma notation, finite series, infinite series</td>
<td>Mar</td>
</tr>
<tr>
<td>X</td>
<td></td>
<td>6-4 Arithmetic Series</td>
<td>262</td>
<td>#52: How do we find the sum of an arithmetic series, find its nth term or first term on any term in the sequence?</td>
<td>Arithmetic series</td>
<td>Mar</td>
</tr>
<tr>
<td>F.BF.2</td>
<td></td>
<td>6-5 Geometric Sequences</td>
<td>266</td>
<td>#53: How do we generate a geometric sequence and find the sum of a geometric series, find its nth term or first term on any term in the sequence?</td>
<td>Geometric sequence, first term, common factor/ratio</td>
<td>Mar</td>
</tr>
<tr>
<td>A.SSE.4</td>
<td></td>
<td>6-6 Geometric Series</td>
<td>270</td>
<td>#54: How do we find the sum of a geometric series?</td>
<td>Geometric series</td>
<td>Mar</td>
</tr>
<tr>
<td>X</td>
<td></td>
<td>6-7 Infinite Series</td>
<td>273</td>
<td>#55: How do we determine that an arithmetic series increases without limit, decreases without limit, or approaches a limit?</td>
<td>Limit, without limit, approaches a limit</td>
<td>Mar</td>
</tr>
</tbody>
</table>

**COMMON ASSESSMENT #6** Mar
### 7 – Exponential Functions

<table>
<thead>
<tr>
<th>Common Core</th>
<th>NYSPI #</th>
<th>Topic/Lesson</th>
<th>Textbook Page</th>
<th>Aim</th>
<th>Vocabulary</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Algebra I</td>
<td>A2.A.8</td>
<td>7-1 Laws of Exponents</td>
<td>287</td>
<td>#56: How do we write and use the laws of exponents in simplifying expressions?</td>
<td>Factor, base, exponent exponential form, standard form</td>
<td>April</td>
</tr>
<tr>
<td>Algebra I</td>
<td>A2.N.1</td>
<td>7-2 Zero and Negative Exponents</td>
<td>289</td>
<td>#57: How do we simplify expressions with negative exponents?</td>
<td>Zero exponent, negative exponent</td>
<td>April</td>
</tr>
<tr>
<td>Algebra I</td>
<td>A2.N.1</td>
<td>7-3 Fractional Exponents</td>
<td>293</td>
<td>#58: How are expressions with fractional exponents simplified?</td>
<td>Fractional exponent, coefficient of a radical</td>
<td>April</td>
</tr>
<tr>
<td>Algebra I</td>
<td>A2.A.12 A2.A.53</td>
<td>7-4 Exponential Functions and Their Graphs</td>
<td>298</td>
<td>#59: How are exponential functions graphed manually and using the graphing calculator?</td>
<td>Exponential function, Cartesian Plane, ordered pair, plotting of points</td>
<td>April</td>
</tr>
<tr>
<td>Algebra I</td>
<td>A2.A.12</td>
<td>7-5 Solving Equations Involving Exponents</td>
<td>304</td>
<td>#60: How do we find their solution of equations involving exponents?</td>
<td>Equations with exponents</td>
<td>April</td>
</tr>
<tr>
<td>Algebra I</td>
<td>A2.A.6</td>
<td>7-6 Solving Exponential Equations</td>
<td>306</td>
<td>#61: How are exponential equations solved?</td>
<td>Exponential equations, base, exponent, power</td>
<td>April</td>
</tr>
<tr>
<td>Algebra I</td>
<td>A2.A.6</td>
<td>7-7 Applications of Exponential Functions</td>
<td>308</td>
<td>#62: How do we solve the different kinds of exponential equation problems?</td>
<td>Exponential equations, base, exponent, power, solutions, extraneous roots</td>
<td>April</td>
</tr>
</tbody>
</table>

**COMMON ASSESSMENT #7**

April
## 8 – Logarithmic Functions

<table>
<thead>
<tr>
<th>Common Core</th>
<th>NYSPI #</th>
<th>Topic/Lesson</th>
<th>Textbook Page</th>
<th>Aim</th>
<th>Vocabulary</th>
<th>Date</th>
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<tr>
<td>F.IF.7e</td>
<td>A2.A.19</td>
<td>8-1 Inverse of an Exponential Function</td>
<td>320</td>
<td>#63: How do we show the inverse of an exponential function and its graph?</td>
<td>Exponential function, inverse of exponential function, logarithm</td>
<td>April</td>
</tr>
<tr>
<td>F.IE.4</td>
<td>A2.A.19</td>
<td>8-2 Logarithmic Form of an Exponential Equation</td>
<td>324</td>
<td>#64: How do we compare logarithmic form from exponential form and convert one form to the other?</td>
<td>Logarithmic form, exponential form</td>
<td>April</td>
</tr>
<tr>
<td>F.IE.4</td>
<td>A2.A.19</td>
<td>8-3 Logarithmic Relationships</td>
<td>327</td>
<td>#65: What are the properties of logarithms and how are they applied?</td>
<td>Properties of logarithms</td>
<td>April</td>
</tr>
<tr>
<td>F.IE.4</td>
<td>A2.A.19</td>
<td>8-4 Common Logarithms</td>
<td>332</td>
<td>#66: How numbers in standard form converted to common logarithmic forms?</td>
<td>Common logarithm</td>
<td>May</td>
</tr>
<tr>
<td>F.IE.4</td>
<td>A2.A.19</td>
<td>8-5 Natural Logarithms</td>
<td>336</td>
<td>#67: How do we simplify powers using natural logarithms?</td>
<td>Natural logarithm</td>
<td>May</td>
</tr>
<tr>
<td>A.SSE.2</td>
<td>A.CED.1</td>
<td>A.IF.8b</td>
<td></td>
<td></td>
<td>Properties of logarithms; properties of equality; properties of real numbers</td>
<td>May</td>
</tr>
<tr>
<td>A.IF.8b</td>
<td>F.LE.4</td>
<td>8-6 Exponential Equations</td>
<td>340</td>
<td>#68: How do we solve exponential equations using logarithmic method?</td>
<td>Properties of logarithms; properties of equality; properties of real numbers</td>
<td>May</td>
</tr>
<tr>
<td>A.IF.8b</td>
<td>F.LE.4</td>
<td>8-7 Logarithmic Equations</td>
<td>344</td>
<td>#69: How do we find the solution of logarithmic equations?</td>
<td>Properties of logarithms; properties of equality; properties of real numbers</td>
<td>May</td>
</tr>
</tbody>
</table>

**COMMON ASSESSMENT #8**

May
### 9 – Trigonometric Functions

<table>
<thead>
<tr>
<th>Common Core</th>
<th>NYSPI #</th>
<th>Topic/Lesson</th>
<th>Textbook Page</th>
<th>Aim</th>
<th>Vocabulary</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geometry</td>
<td>A2.A.55 A2.A.56</td>
<td>9-1 Trigonometry of the Right Triangle</td>
<td>354</td>
<td>#70: How do we find the parts of a right triangle using the sine, cosine, or tangent function?</td>
<td>Hypotenuse, legs, similar triangles, sine, cosine, tangent, acute angle, right angle.</td>
<td>May</td>
</tr>
<tr>
<td>Geometry</td>
<td>A2.A.56 A2.A.62</td>
<td>9-2 Angles and Arcs as Rotations</td>
<td>357</td>
<td>#71: How do we determine that angles are coterminal, quadrant, or both?</td>
<td>Angle, initial side, terminal side, angle in standard position, angular speed, quadrant angles, coterminal angles</td>
<td>May</td>
</tr>
<tr>
<td>F.TF.2</td>
<td>A2.A.60</td>
<td>9-3 The Unit Circle, Sine, and Cosine</td>
<td>362</td>
<td>#72: How do we use the unit circle to find the sine, cosine, and coordinates of the terminal side of an angle in standard position?</td>
<td>Unit circle, sine function, cosine function</td>
<td>May</td>
</tr>
<tr>
<td>Geometry</td>
<td>A2.A.55 A2.A.56</td>
<td>9-4 The Tangent Function</td>
<td>368</td>
<td>#73: How can we use the tangent function to solve any right triangle when the sine and cosine are known?</td>
<td>Tangent function</td>
<td>May</td>
</tr>
<tr>
<td>Geometry</td>
<td>A2.A.55 A2.A.58 A2.A.59</td>
<td>9-5 The Reciprocal Trigonometric Functions</td>
<td>374</td>
<td>#74: How can we solve a right triangle when the reciprocal of the sine, cosine or tangent are known?</td>
<td>Secant, cosecant, cotangent</td>
<td>June</td>
</tr>
<tr>
<td>Geometry</td>
<td>A2.A.56</td>
<td>9-6 Function Values of Special Angles</td>
<td>378</td>
<td>#75: How do we find the six trigonometric functions of special angles?</td>
<td>Special angles, isosceles triangle, 30-60 degree right triangle</td>
<td>June</td>
</tr>
<tr>
<td>Geometry</td>
<td>A2.A.66</td>
<td>9-7 Function Values from the Calculator</td>
<td>381</td>
<td>#76: How do we use the calculator to determine the measure of an angle using degree or radian unit of angular measure?</td>
<td>Degree, radian, central angle, arc, radius, sector</td>
<td>June</td>
</tr>
<tr>
<td>Geometry</td>
<td>A2.A.57 A2.A.66</td>
<td>9-8 Reference Angles and the Calculator</td>
<td>386</td>
<td>#77: How do we express function values of angles greater than 90 degrees as function values of positive acute angles?</td>
<td>Reference angle, negative angle, positive angle, first/second/third/fourth quadrant angle</td>
<td>June</td>
</tr>
</tbody>
</table>

**COMMON ASSESSMENT #9**  

June
SUGGESTED LIST OF MATHEMATICAL LANGUAGE

Suggested List of Mathematical Language
The Suggested List of Mathematical Language is presented for Regents-approved course entitled Algebra 2 & Trigonometry. This list is intended to engage New York State educators and students in building a mathematical language. The list contains terms that are defined in the Glossary (http://www.emsc.nysed.gov/3-8/glossary.htm).

Algebra 2 & Trigonometry

Problem Solving
• algebraically
• alternate approach
• collaborate
• conjecture
• constraint
• critique
• equivalent
• evaluate
• explain
• formulate
• generalization
• graphically
• interpret
• multiple representations
• numerically
• observe
• parameter
• strategy
• verbally

Reasoning and Proof
• argument
• axiom
• conclusion
• conjecture
• counterexample
• discover
• exact answer
• explain
• explore
• general case
• inductive reasoning
• informal indirect proof
• investigate
• justify
• refute
• specific result
• theorem

Communication
• accuracy
• appropriate
• challenge
• chart
• coherent
• comprehension
• conjecture
• decoding
• diagram
• equation
• formula
• function
• graph
• interpretation
• logical argument
• mathematical representation
• numerical tables
• organize
• outline
• rationale
• reflect
• standard notation
• strategy
• symbol
• technical writing

Connections
• concept
• conclusion
• formulate
• multiple representation
• physical model
• procedure
• quantitative model
• representation

Representation
• algebraic representation
• apply
• chart
• communicate
• compare
• concept
• diagram
• equation
• explore
• graph
• graphical representation
• investigate
• mathematical phenomena
• multiple representations
• organize
• physical object
• physical phenomena
• recognize
• record
• social phenomena
• symbol
• table
• technology
• translate
Number Sense and Operations
- a+bi form
- absolute value
- complex fraction
- complex number
- conjugate
- direct variation
- e
- fractional exponent
- i
- imaginary number
- index of a radical
- inverse variation
- irrational number
- negative exponent
- nth root
- operation
- pi
- powers of i
- principal square root
- procedure
- radical
- radical form
- radicand
- rational number
- rationalize a denominator
- real number
- scientific notation
- sigma
- sigma notation

Algebra
- abscissa
- absolute value
- absolute value equation
- absolute value function
- absolute value inequality
- adjacent angles
- adjacent sides
- algebraic expression
- algebraic representation
- ambiguous case
- amplitude
- analyze
- angle
- angle in standard position
- angle of depression
- angle of elevation
- antilogarithm
- approximate value
- arc length
- arccosine
- arcsine
- arctangent
- area of a parallelogram using SAS
- area of a triangle using SAS
- arithmetic sequence
- arithmetic series
- asymptote
- base
- base of a logarithmic function
- base of an exponential function
- binomial expansion
- binomial theorem
- center-radius equation of a circle
- central angle
- circle
- circular functions
- coefficient
- cofunctions
- common base(s)
- common difference
- common factor
- common logarithm
- common ratio
- completing the square
- complex fractional expressions
- composition of functions
- compound interest
- constant function
- cosecant
- cosine
- cotangent
- coterminous angles
- degree of a polynomial
- difference of two perfect squares
- direct variation
- discriminant
- domain
- double and half angle formulas for trigonometric functions
- double root
- e
- equation
- equivalent forms
- exact value
- expand a binomial
- explicit definition
- exponential form
- exponential function
- extraneous root
- factor
- fractional exponent
- frequency (of a periodic function)
- function
- function notation
- geometric sequence
- geometric series
- graphical solution of equations
- greatest common factor (GCF)
- growth factor
- half-life
- horizontal-line test
- i
- identities
- initial side of an angle
- inverse function
- inverse trigonometric functions
• inverse variation
• Law of Cosines
• Law of Sines
• laws of exponents
• laws of logarithms
• linear equation
• linear expression
• linear system
• logarithm
• logarithmic form
• lowest terms
• nature of the roots
• negative exponent
• nth root
• nth term
• one cycle of a trigonometric function
• one-to-one function
• onto
• opposite side in a right triangle
• ordinate
• parabola
• parameter
• period (of a function)
• periodic function
• phase shift
• polynomial expression
• polynomial function
• powers of i
• Pythagorean identities
• quadrantal angle
• quadratic equation
• quadratic formula
• quadratic inequality
• quadratic trinomial
• radian
• radical equation
• radical expression
• radius
• range (of a function)
• rational coefficient
• rational equation
• rational expression
• rational inequality
• rationalize denominators
• reciprocal trigonometric functions
• recursive definition
• reference angle
• relation
• replacement set
• represent
• restricted domain
• resultant
• right triangle trigonometry
• root of an equation
• secant (of an angle)
• sigma notation
• sine
• solution set
• standard position (of an angle)
• subset
• sum and product of roots of a quadratic equation
• sum of a geometric series
• sum of an arithmetic series
• sum or difference formulas for trigonometric functions
• system of equations/inequalities
• tangent (of an angle)
• technology
• terminal side of an angle
• transformation
• transformations of functions and relations
• trigonometric equation
• trigonometric functions
• unit circle
• variable
• vector
• vertical line test
• zero of a function
• zero product property

Geometry
• absolute value
• absolute value equation
• absolute value inequality
• angle in standard position
• angle of depression
• angle of elevation
• area of a parallelogram using SAS
• area of a triangle using SAS
• circle
• coefficient
• function
• generalize
• geometric representation of the circular function
• graph of a relation
• graphical representation
• graphical solution of equations
• investigate
• ordered pair
• parabola
• rational coefficient
• rectangular coordinates
• relation
• root of an equation
• sector of a circle
• slope
• triangle
• vertex
• visualization

Measurement
• arc length
• degree measure
• measure of central angle
• minute
• radian measure

Statistics and Probability
• at least
• at most
• Bernoulli experiments
• biased sample
• bimodal
• binomial probability formula
• bivariate data
• central tendency
• combination
• compound event
• conjecture
• controlled experiment
• correlation coefficient
• Counting Principle
• exactly
• experimental probability
• extrapolate
• frequency (of a data set)
• frequency distribution
• grouped frequency distributions
• index in statistics
• interpolate
• interquartile range
• least squares regression line
• line of best fit
• linear regression
• mean
• measure of central tendency
• measures of dispersion
• median
• mode

• normal curve
• normal distribution
• observation
• outlier
• Pascal's Triangle
• percentile
• permutation
• probability
• quartiles
• random sample
• range (of a data set)
• regression equation
• regression model
• sample space
• scatter plot
• standard deviation (population)
• standard deviation (sample)
• statistics
• survey
• technology
• theoretical probability
• univariate data
• variance (population)
• variance (sample)
WORD WALLS ARE DESIGNED …

- to promote group learning
- support the teaching of important general principles about words and how they work
- Foster reading and writing in content area
- Provide reference support for children during their reading and writing
- Promote independence on the part of young students as they work with words
- Provide a visual map to help children remember connections between words and the characteristics that will help them form categories
- Develop a growing core of words that become part of their vocabulary

Important Notice

- A Mathematics Word Wall must be present in every mathematics classroom.
- The Suggested List of Mathematical Language for Algebra 2 level instruction must be incorporated into the Mathematics Word Wall.

Math Word Wall

- Create a math word wall
- Place math words on your current word wall but highlight them in some way.
SETUP OF THE MATHEMATICS CLASSROOM

I. Prerequisites for a Mathematics Classroom
   • Teacher Schedule
   • Class List
   • Seating Chart
   • Code of Conduct / Discipline
   • Grade Level Mathematics Standards
   • Power Performance Indicators - PPI (Grades 3 – 10)
   • Updated Mathematics Student Work
   • Mathematics Grading Policy
   • Mathematics Diagrams, Charts, Posters, etc.
   • Grade Level Number Line
   • Grade Level Mathematics Word Wall
   • Mathematics Portfolios
   • Mathematics Center with Manipulatives (Grades K - 12)

II. Updated Student Work
    A section of the classroom must display recent student work. This can be of any type of assessment, graphic organizer, and writing activity. Teacher feedback must be included on student’s work.

III. Board Set-Up
    Every day, teachers must display the NYS Standard (Performance Indicator), Aim, Do Now and Homework. At the start of the class, students are to copy this information and immediately begin on the Opening Exercise.

<table>
<thead>
<tr>
<th>Student’s Name:</th>
<th>School:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher’s Name:</td>
<td>Date:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aim #:</th>
<th>NYS Performance Indicator:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening Exercise:</td>
<td></td>
</tr>
</tbody>
</table>

IV. Spiraling Homework
    Homework is used to reinforce daily learning objectives. The secondary purpose of homework is to reinforce objectives learned earlier in the year. The assessments are cumulative, spiraling homework requires students to review coursework throughout the year.
SECONDARY MATHEMATICS GRADING POLICY

This course of study includes different components, each of which are assigned the following percentages to comprise a final grade. I want you–the student–to *understand that your grades are not something that I give you, but rather, a reflection of the work that you give to me.*

COMPONENTS

1. Common Assessments → 35%
2. Quizzes → 20%
3. Homework → 20%
4. Notebook and/or Journal → 10%
5. Classwork / Class Participation → 15%

- Class participation will play a significant part in the determination of your grade. Class participation will include the following: attendance, punctuality to class, contributions to the instructional process, effort, contributions during small group activities and attentiveness in class.

Important Notice

As per MVCSD Board Resolution 06-71, the **Parent Notification Policy** states “Parent(s) / guardian(s) or adult students are to be notified, *in writing*, at any time during a grading period when it is apparent - that the student may fail or is performing unsatisfactorily in any course or grade level. Parent(s) / guardian(s) are also to be notified, *in writing*, at any time during the grading period when it becomes evident that the student's conduct or effort grades are unsatisfactory.”
# SAMPLE NOTEBOOK SCORING RUBRIC

<table>
<thead>
<tr>
<th>Criteria</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Completion of Required Sections</strong></td>
<td>All required sections are complete.</td>
<td>One required section is missing.</td>
<td>Two or three required sections are missing.</td>
<td>More than three required sections are missing.</td>
<td></td>
</tr>
<tr>
<td><strong>Missing Sections</strong></td>
<td>No sections of the notebook are missing.</td>
<td>One sections of the notebook is missing.</td>
<td>Two sections of the notebook are missing.</td>
<td>Three or more sections of the notebook are missing.</td>
<td></td>
</tr>
<tr>
<td><strong>Headers / Footers</strong></td>
<td>No required header(s) and/or footer(s) are missing within notebook.</td>
<td>One or two required header(s) and/or footer(s) are missing within notebook.</td>
<td>Three or four required header(s) and/or footer(s) are missing within notebook.</td>
<td>More than four required header(s) and/or footer(s) are missing within notebook.</td>
<td></td>
</tr>
<tr>
<td><strong>Organization</strong></td>
<td>All assignment and/or notes are kept in a logical or numerical sequence.</td>
<td>One or two assignments and/or notes are not in a logical or numerical sequence.</td>
<td>Three or Four assignments and/or notes are not in a logical or numerical sequence.</td>
<td>More than four assignments and/or notes are not in a logical or numerical sequence.</td>
<td></td>
</tr>
<tr>
<td><strong>Neatness</strong></td>
<td>Overall notebook is kept very neat.</td>
<td>Overall notebook is kept in a satisfactory condition.</td>
<td>Overall notebook is kept in a below satisfactory condition.</td>
<td>Overall notebook is unkept and very disorganized.</td>
<td></td>
</tr>
</tbody>
</table>

**Total**

Teacher’s Comments:
CLASSROOM AESTHETICS

“PRINT–RICH” ENVIRONMENT CONDUCIVE TO LEARNING

TEACHER NAME: ________________________________

COURSE / PERIOD: ________________________________

ROOM: ________________________________________

CHECKLIST

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Schedule</td>
<td></td>
</tr>
<tr>
<td>Class List</td>
<td></td>
</tr>
<tr>
<td>Seating Chart</td>
<td></td>
</tr>
<tr>
<td>Code of Conduct / Discipline</td>
<td></td>
</tr>
<tr>
<td>Grade Level Mathematics Standards</td>
<td></td>
</tr>
<tr>
<td>Power Performance Indicators - PPI (Grades 3 - 10)</td>
<td></td>
</tr>
<tr>
<td>Mathematics Grading Policy</td>
<td></td>
</tr>
<tr>
<td>Mathematics Diagrams, Posters, Displays, etc.</td>
<td></td>
</tr>
<tr>
<td>Grade Level Number Line</td>
<td></td>
</tr>
<tr>
<td>Updated Student Work (Projects, Assessments, Writing, etc.)</td>
<td></td>
</tr>
<tr>
<td>Updated Student Portfolios</td>
<td></td>
</tr>
<tr>
<td>Updated Grade Level Mathematics Word-Wall</td>
<td></td>
</tr>
<tr>
<td>Mathematics Centers with Manipulatives</td>
<td></td>
</tr>
<tr>
<td>Organization of Materials</td>
<td></td>
</tr>
<tr>
<td>Cleanliness</td>
<td></td>
</tr>
</tbody>
</table>

Principal Signature: ________________________________ Date: ___________

Asst. Pri. Signature: ________________________________ Date: ___________

25
SYSTEMATIC DESIGN OF A MATHEMATICS LESSON

What are the components of a Mathematics Block?

<table>
<thead>
<tr>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluency Practice</td>
</tr>
<tr>
<td>• Information processing theory supports the view that automaticity in math facts is fundamental to success in many areas of higher mathematics. Without the ability to retrieve facts directly or automatically, students are likely to experience a high cognitive load as they perform a range of complex tasks. The added processing demands resulting from inefficient methods such as counting (vs. direct retrieval) often lead to declarative and procedural errors. Accurate and efficient retrieval of basic math facts is critical to a student’s success in mathematics.</td>
</tr>
<tr>
<td>Opening Exercise - Whole Group</td>
</tr>
<tr>
<td>• This can be considered the motivation or Do Now of the lesson</td>
</tr>
<tr>
<td>• It should set the stage for the day's lesson</td>
</tr>
<tr>
<td>• Introduction of a new concept, built on prior knowledge</td>
</tr>
<tr>
<td>• Open-ended problems</td>
</tr>
<tr>
<td>Conceptual Development - Whole Group (Teacher Directed, Student Centered)</td>
</tr>
<tr>
<td>• Inform students of what they are going to do. Refer to Objectives. Refer to the Key Words (Word Wall)</td>
</tr>
<tr>
<td>• Define the expectations for the work to be done</td>
</tr>
<tr>
<td>• Provide various demonstrations using modeling and multiple representations (i.e. model a strategy and your thinking for problem solving, model how to use a ruler to measure items, model how to use inch graph paper to find the perimeter of a polygon,)</td>
</tr>
<tr>
<td>• Relate to previous work</td>
</tr>
<tr>
<td>• Provide logical sequence and clear explanations</td>
</tr>
<tr>
<td>• Provide medial summary</td>
</tr>
<tr>
<td>Application Problems - Cooperative Groups, Pairs, Individuals, (Student Interaction &amp; Engagement, Teacher Facilitated)</td>
</tr>
<tr>
<td>• Students try out the skill or concept learned in the conceptual development</td>
</tr>
<tr>
<td>• Teachers circulate the room, conferences with the students and assesses student work (i.e. teacher asks questions to raise the level of student thinking)</td>
</tr>
<tr>
<td>• Students construct knowledge around the key idea or content standard through the use of problem solving strategies, manipulatives, accountable/quality talk, writing, modeling, technology applied learning</td>
</tr>
<tr>
<td>Student Debrief - Whole Group (Teacher Directed, Student Centered)</td>
</tr>
<tr>
<td>• Students discuss their work and explain their thinking</td>
</tr>
<tr>
<td>• Teacher asks questions to help students draw conclusions and makereferences</td>
</tr>
<tr>
<td>• Determine if objective(s) were achieved</td>
</tr>
<tr>
<td>• Students summarize what was learned</td>
</tr>
<tr>
<td>• Allow students to reflect, share (i.e. read from journal)</td>
</tr>
<tr>
<td>Homework/Enrichment - Whole Group (Teacher Directed, Student Centered)</td>
</tr>
<tr>
<td>• Homework is a follow-up to the lesson which may involve skill practice, problem solving and writing</td>
</tr>
</tbody>
</table>
Remember: Assessments are on-going based on students’ responses.

Important Notice

- All lessons must be numbered with corresponding homework. For example, lesson #1 will corresponded to homework #1 and so on.
- Writing assignments at the end of the lesson (closure) bring great benefits. Not only do they enhance students' general writing ability, but they also increase both the understanding of content while learning the specific vocabulary of the disciplines.
- Spiraling Homework
  - Homework is used to reinforce daily learning objectives. The secondary purpose of homework is to reinforce objectives learned earlier in the year. The assessments are cumulative, spiraling homework requires students to review coursework throughout the year.
  - Manipulative must be incorporated in all lessons. With students actively involved in manipulating materials, interest in mathematics will be aroused. Using manipulative materials in teaching mathematics will help students learn:
    a. to relate real world situations to mathematics symbolism.
    b. to work together cooperatively in solving problems.
    c. to discuss mathematical ideas and concepts.
    d. to verbalize their mathematics thinking.
    e. to make presentations in front of a large group.
    f. that there are many different ways to solve problems.
    g. that mathematics problems can be symbolized in many different ways.
    h. that they can solve mathematics problems without just following teachers' directions.
- SPIRALLING OF HOMEWORK - Teacher will also assign problems / questions pertaining to lessons taught in the past.
- Always write, use and allow students to generate Effective Questions for optimal learning
- Based on assessment(s), Re-teach the skill, concept or content using alternative strategies and approaches
- Assessment: Independent Practice (It is on-going! Provide formal assessment when necessary / appropriate)

Homework, projects or enrichment activities should be assigned on a daily basis.