

**Mr. Smulligan – Lowell High School Mathematics Department  
1351 – Algebra 2 Room Management Plan 2013 – 2014**

*Course Syllabus and Classroom Policies and Procedures 2013-2014*

**COURSE CONTENT:** *The major goals of algebra class are for students to reason abstractly and quantitatively, to construct viable arguments and critique the reasoning of others, and to look for and express regularity in repeated reasoning( taken from the Mathematical Practice Standards).*

	<b>Units</b>	<b>Includes Standard Clusters*</b>	<b>Mathematical Practice</b>
<b>Semester One</b>	<b>Unit 1</b>  <b>Making sense of the structure in algebraic expressions and Reasoning with equations and inequalities</b>	<ul style="list-style-type: none"> <li>• Interpret the structure of expressions (A-SSE.1.2)</li> <li>• Write expressions in equivalent forms to solve problems (A-SSE.4)</li> <li>• Understand solving equations as a process of reasoning and explaining the reasoning (A-REI.2)</li> <li>• Represent and solve equations and inequalities graphically (A-REI.11)</li> <li>• Create equations that describe numbers or relationships (A-CED.1.4)</li> <li>• Understand and evaluate random processes underlying statistical experiments (S-IC.1.2)</li> <li>• Use probability to evaluate outcomes of decisions (S-MD.6)</li> </ul>	<p>Make sense of problems and persevere in solving them.</p> <p>Reason abstractly and quantitatively.</p> <p>Construct viable arguments and critique the reasoning of others.</p> <p>Model with mathematics.</p>
	<b>Unit 2</b>  <b>Interpreting and building functions</b>	<ul style="list-style-type: none"> <li>• Interpret functions that arise in applications in terms of a context ((F-IF.4.5.6)</li> <li>• Analyze functions using different representations ((F-IF.7.8.9)</li> <li>• Build a function that models a relationship between two quantities(F-BF.1)</li> <li>• Build new functions from existing functions (F-BF.3.4)</li> <li>• Represent constraints by equations or inequalities and systems and interpret solutions as viable and non-viable options in a modeling context (A-CED.3)</li> <li>• Create equations in three variables and use them to solve problems (A-CED.2)</li> <li>• Graph equations in three variables (A-CED.2)</li> </ul>	<p>Use appropriate tools strategically.</p> <p>Attend to precision.</p> <p>Look for and make use of structure.</p> <p>Look for and express regularity in repeated reasoning.</p>

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<b>Semester Two</b>	<b>Unit 3</b>	<ul style="list-style-type: none"> <li>• Perform arithmetic operations with complex numbers (N-CN.1.2)</li> <li>• Use complex numbers in polynomial identities and equations (N-CN.7)</li> <li>• Perform arithmetic operations on polynomials (A-APR.1)</li> <li>• Understand the relationship between zeros and factors of polynomials (A-APR.2.3)</li> <li>• Use polynomial identities to solve problems (A-APR.4)</li> <li>• Rewrite rational expressions (A-APR.6)</li> <li>• Solve simple rational and radical equations in one variable. Show how extraneous solutions may arise (A-REI.2)</li> <li>• Extend polynomial identities to the complex numbers (N-CN.8)</li> <li>• Know the Fundamental Theorem of Algebra (N-CN.9)</li> <li>• Know and apply the Binomial Theorem (A-APR.5)</li> <li>• Add, Subtract, Multiply and Divide Rational Expressions (A-APR.7)</li> <li>• Understand that rational expressions form system analogous to rational numbers (A-APR.7)</li> </ul>	<p>Make sense of problems and persevere in solving them.</p> <p>Reason abstractly and quantitatively.</p> <p>Construct viable arguments and critique the reasoning of others.</p> <p>Model with mathematics.</p> <p>Use appropriate tools strategically.</p> <p>Attend to precision.</p> <p>Look for and make use of structure.</p>
	<b>Unit 4</b>	<p style="text-align: center;"><b>Exponential, Logarithmic, and Trigonometric functions</b></p> <ul style="list-style-type: none"> <li>➤ Building new functions from existing functions (F-BF.4-5).</li> <li>➤ Analyze functions using different representations (F-IF.7).</li> <li>➤ High Honors students will have a more in depth study of logistic growth functions algebraically and graphically.</li> <li>• Graph exponential and logarithmic equations (A-REI.11)</li> <li>• Solve exponential and logarithmic equations (F-LE.4)</li> <li>• Extend the domain of trigonometric functions using the unit circle (F-TF.1.2)</li> <li>➤ High Honors students will be required to memorize unit circle.</li> <li>➤ High Honors students will have exposure to degrees and radians, but work predominantly in radians.</li> <li>➤ Analyze functions using different representations (F-IF.7).</li> <li>• Model periodic phenomena with trigonometric functions (F-TF.5)</li> <li>• Prove and apply trigonometric identities (F-TF.8)</li> <li>➤ Honors students will be required to memorize fundamental trigonometric identities and double-angle formulas.</li> <li>➤ Honors students will also work with power-reducing formulas and half-angle formulas.</li> <li>➤ Apply trigonometry to triangles (G-SRT.9-11).</li> </ul>	<p>Look for and express regularity in repeated reasoning.</p>

\*In some cases clusters appear in more than one unit within a course or in more than one course. In some cases only certain standards within a cluster are included in a unit.

➤ Denotes topics covered in high honors level course.

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**CORE IDEA**

The major goals of this course are to define functions, algebraically manipulate expressions, and model and solve equations. Building on their work with linear and quadratic functions, students will extend their repertoire of functions to include polynomial, rational, radical and trigonometric functions. Students can expect to develop these skills through a combination of class work, homework, independent study and group centered activities.

**Texts:** Prentice Hall Algebra 2 (subject to some change)

**Semester 1 Content, Objectives and Expectations:**

**By the end of this semester, students should be able to:**

- Solve a multi-step equation, in one variable, involving one or more of the following: Distributive Property, variables on both sides, combining like terms, Multiplicative Inverse
- Solve absolute value equations and inequalities.
- Generalize what they have learned about a variety of family of functions.
- Solve a system of equations in two variables using a variety of methods.
- Solve a system of equations in three variables using a variety of methods.
- Add, subtract, multiply and divide polynomial functions.
- Factor a variety of polynomial functions.

**Essential questions:**

- Can you create an equation to represent and solve a real-world situation?
- Do you recognize the relationship between a parent function and its transformation?
- Can you apply transformations to a new function family?
- How would you use polynomial operations to represent a real-world situation? (i.e. creating a model of a box given the volume)
- How do inverse operations apply to factoring polynomial functions?

**Long term assignments:**

- Quarter 1 project: Applying Linear Functions to the Real World
- Midterm exam(Units 1 and 2): Due date announced by teacher

**Semester 2 Content, Objectives and Expectations:**

**By the end of this semester, students should be able to:**

- Perform arithmetic operations with complex numbers
- Use complex numbers in polynomial identities and equations
- Graph radical functions, including transformations and identify the domain and range.
- Solve radical equations, with or without extraneous solutions.
- Graph rational functions
- Solve rational equations

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- Evaluate logarithms and their properties
- Solve equations containing logarithms
- Use the coordinate plane to extend trigonometry to model periodic phenomena.

**Essential Questions:**

- Can you understand that the complex number system is analogous to the real number system? (operations, solving, graphing)
- Can you apply your prior knowledge of transformations to a new function family? (radical and rational functions)
- What strategies do you use to analyze the domain and range of a function?
- How are logarithms and exponential functions related?
- Can you solve equations from each function family (radical, rational, exponential, and logarithmic)?
- What features would you use to graph each particular type of function: radical, rational, logarithmic, exponential, and trigonometric?
- How can you use the periodic behavior of trigonometric functions to model real-world phenomena?
- How can we use the trigonometric identities to help verify proofs and manipulate and simplify trigonometric expressions?
- How can the Law of Sines and the Law of Cosines be used to model and solve real-world problems?

**Long term assignments:**

- Quarter 3 project: Applications of Quadratic Functions in Everyday Life
- Final exam(Units 3 and 4): Due date announced by teacher

**Other Pertinent materials:** TI-83, TI-84, or TI-84 Plus are the preferred calculators by the department.

**Classroom Policies**

**1. Equipment**

- Each student will be expected to bring the following to class everyday:
  1. 3 ring binder
  2. Pens or pencils
  3. Calculator
- Each student will be expected to cover the textbook and maintain the condition it is in when issued. If the book is lost or badly damaged the student to whom it was issued will pay the replacement cost.

**2. Grading Policy**

Homework/Classwork	15%
Quizzes/Tests	60%
Quarterly Exam	25%

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**3. Homework**

- Homework will be assigned every day and will be due the following day at the beginning of class. Late homework assignments will not receive any credit.
- Several times each quarter homework assignments will be collected for grading. For this reason, please use a 3 ring binder. It will be much easier to stay organized throughout the school year with a binder as opposed to a spiral bound notebook.
- A student who is absent from class will receive a grade of 0 for the day's homework. Homework missed because of an excused absence must be submitted the day the student returns to school. Homework missed because of an unexcused absence will not be accepted.

**4. Quizzes/Tests**

- Quizzes and tests will be given periodically and will be based on the homework assignments and classwork. Students who miss a quiz or test because of an excused absence will be allowed to take a make-up quiz or test. Otherwise, make-ups will not be given.
- Missed quizzes or tests can be made up as many as five days after the student's return to school. After five days make ups will NOT be given.
- Students will not be allowed to use graphing calculators on any quiz or test.

**5. Rules**

- Be on time.
- Bring a pen or pencil and a notebook to class.
- The teacher dismisses the class, not the bell. Stay in your seat until the bell rings.
- ID's will be worn at all times.
- Do not ask to go to the bathroom during a lecture.
- Students are not allowed to use their cell phones in class. Please have them turned off when you arrive for class.
- iPods are not allowed in school and will be confiscated. Please do not bring them to class.
- Please pick up any trash around your desk at the end of the class.

**6. Attendance**

- The school policy on class attendance will be enforced. Here is the school policy: Anyone with more than 8 unexcused absences in a semester course will receive a grade of *U*.

**7. Expected parent involvement**

- Set up a homework time everyday.
- Ensure that your child gets to school on time.
- Ask your child if he/she has homework.
- Be familiar with, and support, Mr. Smulligan's Room Management Plan.

**8. Extra Help**

- I will make myself available for extra help every day before school. I am usually in my room by 7:15am. An appointment is not necessary.
- I can be reached by e-mail at [psmulligan@lowell.k12.ma.us](mailto:psmulligan@lowell.k12.ma.us).

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***Please sign and return this entire page by September 6, 2013.***

Dear Parents/Guardians and Students,

**WELCOME BACK!** I am delighted to be your child's math teacher during this important academic year. I will work hard to provide students with opportunities to improve their mathematical thinking and writing skills.

I have reviewed the course information and expectations with the students. However, knowing the benefits of strong home-school communication, I would appreciate your acknowledgement that you have also read and reviewed this packet of information with your child. Also, please take note of the school's policy on plagiarism.

**Academic Dishonesty/Plagiarism and Cheating**

- The willful giving or receiving of an unauthorized text, unfair, dishonest, or unscrupulous advantage in academic work over other students using fraud, duress, deception, theft, trickery, talking, signs, gestures, text messaging, copying, or any other methodology will not be tolerated. Any student participating in any of the above behaviors will be referred to their housemaster and will be issued a 0 for any assignment(s) pertaining to these behaviors.
- **Plagiarism** is the submission or presentation of another person's work, language, thoughts, ideas, or expressions as your own original work. This includes all information downloaded from the internet. Any student who submits plagiarized work will be referred to their housemaster and will be given a 0 for the assignment. It is important to remember to correctly cite another person's work using the MLA or APA format.

I look forward to working with your child and meeting you at the upcoming Parent's night in October. If you have any questions or concerns, please contact me at any time. My email is [psmulligan@lowell.k12.ma.us](mailto:psmulligan@lowell.k12.ma.us).

**I have read and reviewed the class rules, course goals and requirements with my child and I understand the expectations in Math class this year.**

Parent/Guardian's Name (please print) \_\_\_\_\_

Parent/Guardian's Signature \_\_\_\_\_

Parent/Guardian email (optional) \_\_\_\_\_

**I have read and reviewed the class rules, course goals and requirements, and I understand the expectations in Math class this year.**

Student Name (please print) \_\_\_\_\_

Student's Signature \_\_\_\_\_

Student's email (optional) \_\_\_\_\_

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