



# Honors Advanced Algebra

J.S. Morton HS  
District 201  
2014-2015

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## What will students learn in this course?

SEMESTER 1 Key Concepts	Standards – Learning Targets <i>I can...</i>
Representing Functions	1A. Graph, transform and identify key features of absolute value functions
	1B. Graph piecewise and step functions
	1C. Solve linear systems in 3 variables
Polynomial Functions	2A. Perform arithmetic operations including adding, subtracting, and multiplying with complex numbers.
	2B. Graph, transform and identify the key features of a polynomial function and make connections between algebraic and graphical forms.
	2C. Add, subtract, and multiply polynomials and explain why solutions are equivalent
	2D. Create polynomial functions given factors and zeros.
	2E. Apply the Remainder Theorem to determine the factors and zeros of a polynomial functions.
	2F. Solve polynomials algebraically and graphically by using technology
	2G. Analyze a polynomial function in multiple representations (equations, table or graph) within a context and make conclusions on the features
Rational Functions	3A. Perform operations with rational expressions to demonstrate the analogy with integers.
	3B. Graph, transform and identify the key features of the graph of a rational function
	3C. Solve rational equations and identify, if any, extraneous solutions
	3D. Solve systems involving rational equations and identify, if any, extraneous solutions
Rational Exponents & Radicals	4A. Use properties of integer exponents and apply them to rational exponents
	4B. Convert between exponential and radical forms
	4C. Make decisions about the results of adding and multiplying combinations of rational and irrational numbers
	4D. Solve an equation involving radicals or rational exponents and identify, if any, extraneous solutions
	4E. Graph, transform and identify the key features of the square roots and cube root functions
Exponential & Logarithmic Functions	5A. Graph, transform and identify the key features of the graph of an exponential and logarithmic functions
	5B. Explain why exponential and logarithmic equations can be written in equivalent forms
	5C. Evaluate logarithms using change of base formula with technology
	5D. Solve exponential equations in base 2, 10 and e by using the properties of logarithms
	5E. Calculate and interpret the average rate of change of a function as it relates to real world situations.
	5F. Solve problems using the formula for the sum of a geometric series

SEMESTER 2 Key Concepts	Standards – Learning Targets <i>I can...</i>
Trigonometry	6A. Utilize a unit circle to determine trigonometric values of special angles
	6B. Interpret and utilize a unit circle in radians
	6C. Graph, transform and identify the key features of trigonometric functions
	6D. Use the Pythagorean identity to find $\sin(\theta)$ , $\cos(\theta)$ , or $\tan(\theta)$ and the quadrant of the angle.
	6E. Apply trigonometric functions to model real life phenomena
Systems & Comparing Functions	7A. Solve a system of various functions using technology.
	7B. Key features of multiple functions can be compared using various representations.
Probability	8A. Identify if two events are independent utilizing probability tests.
	8B. Use the rules of probability to compute probabilities of compound events in a uniform probability model
	8C. Construct and interpret a two-way frequency table and test for independence
	8D. Explain conditional probability and independence using everyday examples of events based on the context of the problem.
	8E. Compute probabilities of independent, dependent and compound events and use these to interpret data
Statistics	9A. Recognize the purposes and differences among sample surveys, experiments and observational studies
	9B. Use simulation to determine if the data collected is consistent with the selected model or if another model is required
	9C. Use the mean and standard deviation of data to fit into a normal distribution and to estimate population percentages
	9D. Create a randomized experiment to compare two treatments, use simulation to determine significant differences
	9E. Sketch the function of best fit on a scatter plot and find the function.

### How will we know students have learned it?

Grade Scale	A- Advanced/Exemplary	B- Proficient	C- Basic	D- Needs Improvement	E- Not Passing
	4.0-5.0	3.0-3.9	2.0-2.9	1.0-1.9	0.0-0.9

Unit Weights	Semester 1		Semester 2	
	Unit 1 - Representing Functions	16%	Unit 7 – Trigonometry	20%
	Unit 2 - Polynomial Functions	16%	Unit 8 - Systems & Comparing Functions	20%
	Unit 3 - Rational Functions	16%	Unit 9 - Probability	20%
	Unit 4 Radicals & Rational Functions	16%	Unit 10 – Statistics	20%
	Unit 5 - Exponent & Logarithmic Functions	16%	Final Exam	20%
	Final Exam	20%		

Within each unit, assignments will be graded according to the following weights:

<b>Assignment Categories</b>	Common unit assessments (Comprehensive unit exams; 1 per unit)	60%
	Classroom assessments (Checks (Quizzes), projects; 1-3 per unit)	30%
	Formative Assignments (Practice assignments, in-class assignments, etc.; varies)	10%

Formative assignments are 10% in each unit because students should not be unduly penalized for mistakes during the learning process. The grade is primarily based on mastery of standards, and mastery is demonstrated on assessments. Complete all practice (homework) assignments on a separate sheet of paper. Write your **name, date, and assignment description at the top of each page**. Practice is checked daily at the beginning of each class period and the final tally of assignments serves as a homework grade for each unit.

<b>Course Requirements</b>	What must every student pass to earn credit for the course? Student must pass every key concept with a 1.0 to earn course credit.
	What must every student complete to earn credit for the course? Students must complete every classroom test, quiz, and project in order to earn credit for the course.
	What other requirements must every student meet? Students must complete 4 key concepts 1 <sup>st</sup> semester and 5 key concepts 2 <sup>nd</sup> semester.

Students who do not meet these requirements will receive an I (incomplete) for the semester. If requirements are not met within six weeks after the semester, the student will earn a grade of E.

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## What will we do when students aren't learning?

### Extra Help

Students who are not passing the course are expected to seek extra help. In addition, any student who wants to improve his or her performance and grade is encouraged to ask for support.

- Classroom: see website for details
- BLAST
- NHS and/or Supervisory tutoring
- Math Lab
- Parent Liaison: Ms. Jessica Ibarra
  - 708-780-4000 ext.
  - jibarra@jsmorton.org

### Re-do/Re-Take

Students are eligible and **expected** to re-do projects, quizzes, and tests that do not meet or exceed standards:

- Retake mandatory:  $0.0 \leq \text{score} < 1.0$
- Retake suggested:  $\text{score} \geq 1.0$

Daily assignments may be eligible for re-do only at the teacher's discretion. Students will be provided one opportunity for re-do on a given item, with any additional attempts at the teacher's discretion.

The teacher will communicate any requirements that must be met prior to the re-do (i.e. after-school tutoring, extra practice assignments, etc.), as well as the deadline.

The maximum grade earned shall be full credit, given the original item is submitted on time with full effort. The teacher has the discretion to return any item, ungraded, that is incomplete or does not demonstrate full effort. That item will be subject to the teacher's late work policy, with the final grade reflecting any loss of credit due to late or incomplete submission.

Other than common assessments, teachers may provide an alternative assignment to demonstrate mastery.

## What will we do when students have already learned it?

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Students who master the standards before the end of the key concept will be offered enrichment assignments or projects to extend their learning. Students who decline are expected to complete required key concept assignments and. Students are also encouraged to join Mathletes and/or take the IML math competitions in order to extend their knowledge of challenging topics. The dates of contests are posted on the classroom bulletin board.

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## Procedures

- Students are expected to inquire about missed learning/assignments immediately upon return from an absence.
- Students will make-up or re-take exams: Places include room 350 or at the testing center, available from 8:00-8:45 on Late Start Days.
- Daily participation is expected.
- All students will be given access codes for the online version of the **Mathematics III** textbook.
- Students must be in their seats before the bell rings to begin class.
- Parents are strongly encouraged to use Skyward Family Access to be informed on students' progress. For assistance setting up a password, please contact your school and request to talk to your Parent Liaison.
- Follow the classroom expectations and encourage others to do the same.

## Supplies

Students must have a **pencil** and **1 or 1.5 inch Math binder**. Your binder must have four distinct sections separated with dividers.

- Section 1: Self Assess
- Section 2: Notes & Handouts
- Section 3: Practice (Homework)
- Section 4: Quizzes/Exams/Projects

Please do not discard your work. Your notes may serve as a guide in your future math courses.

## TI-Nspire Graphing Calculators

- Graphing calculators are an integral part of Pre-Calculus and AP Calculus. You have already learned how to operate a graphing calculator and will continue to use this valuable technology during Pre-Calculus and AP Calculus at Morton East and throughout your math courses in college.
- Pre-Calculus prepares you for taking Calculus and you will need to use a graphing calculator for the AP Calculus exam. If you already have a TI-Nspire, TI-83+, or TI-84, you are already prepared.
- If you don't have one yet, the Texas Instrument TI-Nspire CX (CX stands for color) is the suggested graphing calculator. Alternative graphing calculators would be the TI-83+ or TI-84. These can be purchased at local stores or online.

**Notice: The TI-Nspire CAS (CAS stands for computer algebra system) and TI-89 ARE NOT allowed for the ACT, but are allowed for the AP exam.**

## Honors Advanced Algebra Assessment & Grading Rubric Plan

3 Levels of Assessment Questions	
<i>Basic Questions</i>	1 point each
<i>Proficient Questions</i>	3 points each
<i>Advanced Questions</i>	6 point each
<i>All points are cumulative</i>	

## Honors Advanced Algebra

Unit 1 Proficiency Scale: Special Functions and Linear Systems	
<b>5.0</b>	<p>The student who earns a 5.0 in this unit has shown high level performance. The student's work is not only clear, precise, and well-reasoned, but insightful as well. Essential terms and key concepts are mastered at <i>all</i> levels: Basic, Proficient, and Advanced. The 5.0 student consistently raises questions and issues, analyzes questions and problems clearly and precisely, clarifies key concepts competently, identifies relevant competing points of view, and reasons carefully from clearly stated premises in a subject. Problem-solving within real-world applications displays a unique level of reasoning. They construct inferences and applications that go beyond what was taught.</p> <p><b>The student has completely mastered all basic, proficient and advanced level test items on the summative assessment.</b></p>
<b>4.0</b>	<p>The student who earns a 4.0 in this unit has comprehensive thinking and performance. The student's work is, the vast majority of the time, clear, precise, and well-reasoned, and has some depth of insight. Essential terms and key concepts are learned at a level which implies mastery of all Basic- and Proficient-level standards. The 4.0 student regularly raises questions and issues, analyzes questions and problems clearly and precisely, clarifies key concepts competently, often identifies relevant competing points of view, and reasons carefully from clearly stated premises in a subject. Problem-solving within real-world applications displays thorough reasoning.</p> <p><b>The student has demonstrated complete understanding of all 8 basic and 7 proficient level test items on the summative assessment. In addition, the student demonstrates partial understanding, earning 3 of 6 points, on the advanced-level test item on the summative assessment.</b></p>
<b>3.0</b>	<p>The student who earns a 3.0 in this unit has sound thinking and performance. The student's work is, the majority of the time, clear, precise, and well-reasoned, but does not have depth of insight. Essential terms and key concepts are learned at a level which implies comprehension of Basic-level concepts and standards. The 3.0 student often raises questions and issues, analyzes questions and problems clearly and precisely, clarifies key concepts competently, sometimes identifies relevant competing points of view, and demonstrates the beginnings of a commitment to reason carefully from clearly stated premises in a subject. Problem-solving within real-world applications displays sound reasoning.</p> <p><b>The student has demonstrated complete understanding of all 8 basic level test items and also has earned 20 points from the proficient level or advanced level test items.</b></p>
<b>2.0</b>	<p>The student who earns a 2.0 in this unit has mixed thinking and performance. The student's work is inconsistently clear, precise, and well-reasoned. The work does not display depth of insight or even consistent competence. Essential terms and key concepts are learned at a Basic level. Problem-solving within real-world applications displays inconsistent reasoning.</p> <p><b>The student has demonstrated complete understanding of all 8 basic level test items and also has earned 17 points from the proficient level or advanced level test items. The 3 Learning Targets on the summative assessment include:</b></p> <ul style="list-style-type: none"> <li>• Graph, transform, and identify key features of absolute value functions.</li> <li>• Graph piecewise and step functions.</li> <li>• Solve linear systems in 3 variables.</li> </ul>

1.0	<p>The student who earns a 1.0 on this unit has poor thinking and performance. The majority of the time, the student tries to get through the course by means of rote recall, attempting to acquire knowledge by memorization rather than through comprehension and understanding. The student has not developed critical thinking skills and understandings as requisite to understanding course content. A 1.0 on the unit represents thinking that is typically unclear, imprecise, and poorly reasoned. The student has not yet achieved competence on the Basic level. Essential terms and key concepts are often incorrectly used and reflect a superficial or mistaken comprehension of basic concepts and standards.</p> <p><b>The student has demonstrated complete understanding of all 8 basic level test items and also has earned 13 points from the proficient level or advanced level test items to receive a passing grade on the summative assessment.</b></p>
0.9-0.0	<p>The student who earns a 0.0 on this unit has tried to get through the course by means of rote recall. The student has not developed critical thinking skills and concepts as required to understanding course content. A 0.0 on the unit represents thinking that is regularly unclear, imprecise, and poorly reasoned. The student has not yet achieved competence in his/her academic work. Essential terms and key concepts are consistently incorrect and reflect a mistaken comprehension of Basic-level concepts and standards.</p> <p><b>The student has not yet demonstrated complete understanding of all 8 basic level test items nor the needed additional 13 points from the proficient level or advanced level test items to receive a passing grade on the summative assessment.</b></p>

Unit 1 Summative Assessment Grading Plan
<b>Total Point Breakdown</b>
<p>8x1 = 8 - Basic Points  7x3 =21 - Proficient Points  1x6 = 6 - Advanced Points  35 - Total Points</p>
<b>0-5 Interval Grade Breakdown</b>
5.0 = 35 points
4.0 = 32 points
3.0 = 28 points
2.0 = 25 points
1.0 = 21 points, Retake Suggested
0.0 = Below 21 points, Retake Required