

BEST High School
Algebra 2 Mat271/272
Justin Ochsner
Competency-based Syllabus

Desired Results

Credit: .125 per session

Estimate of hours per week engaged in learning activities: 5 hours

Course Overview:

This class explores mathematical concepts that go beyond the scope of an Algebra 1 class. Algebra 2 bridges high school mathematics to upper level mathematics that students may take in college. Students planning on pursuing higher education after high school should take Algebra 2. Topics include: linear and quadratic functions, exponents, logarithms, sequences, radicals, polynomials and rational expressions.

Students may take this course as a self-paced, independent-study course. Or, they may take it as part of a traditional class. A pretest will determine the assignments that are necessary to be successful. The summative assessment will be given when students are ready. Students may earn credit faster than in a traditional class.

Instructional Materials:

Students will use a combination of computer software and paper-and-pencil assignments. Students need to bring paper and writing utensils to class, as well as a notebook to keep track of assignments, notes, quizzes, etc. Students will need a scientific calculator. Classroom calculators are available for students who do not have their own.

Semester 1:

Session 1 (9/6 – 10/4) – Linear Equations and Inequalities

Session 2 (10/5 – 11/4) – Relations and Functions

Session 3 (11/7 – 12/9) – Quadratics, Part 1

Session 4 (12/12 – 1/27) – Quadratics, Part 2

Semester 2:

Session 5 (1/30 – 3/2) – Rational, Irrational, and Complex Numbers

Session 6 (3/5 – 3/30) – Polynomial Functions

Session 7 (4/9 – 5/11) – Exponents and Logarithms

Session 8 (5/14 – 6/22) – Rational Expressions and Equations

All summative assessments are due by 1 pm two school days before the end of session

All coursework is aligned with the Washington State and District EALR's

Students earn credit for proficient completion of each session's summative assessments

Instructor Info:

Justin Ochsner

Best High School

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425.936.2300

Instructor's Note: I encourage you to seek out help from me during the school year. Not only during class, but also please feel free to arrange time to meet with me before and after school, and to always ask for help when needed.

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Session Grading Policy

- This course is divided into **8** sessions.
- Completion of each session will earn **.125** credit.
- Grades that can be earned are: A, B, C, or NC.

Assessment for Learning

In this course, our main focus is for each student to understand the concepts of Geometry and be able to apply them to solve problems. In order to best promote and support students' learning, we are going to shift our assessment practices so students will have a clear understanding of what they are expected to know and be able to do. Students will be given many opportunities to practice these skills and work to master the content through classroom activities, homework, and penalty free quizzes before showing what they know on our summative tests. Students will frequently be asked to self-assess their understanding, and to work in pairs, small groups, or as a class to improve each others' comprehension.

Formative Warm Ups/Class work/Homework/Notebooks

Students will be given warm ups, group work, class work, and homework assignments to practice their skills individually on a regular basis. These assignments are crucial for students to expand their understanding, and will give both the students and me an opportunity to check their comprehension of small chunks of material before moving on. It is very important that the students attempt and give serious thought to all problems, as our difficult content is best learned through this individual practice and sometimes struggle. Homework assignments will be discussed and checked the next day in class, giving students the opportunity to ask questions of each other and me to further increase their understanding.

Formative Quizzes

We will have short, penalty-free quizzes about once a week throughout the year. The sole purpose of these quizzes is for students to gauge their current understanding and correct misconceptions. These quizzes will not count as part of a student's grade, but will be used to determine which concepts each student needs to work with more to master.

Summative Assessments

100% of the students' grade is determined by the summative assessment. At the end of each session, we will have a summative assessment where students will be asked to show that they have learned the material, can perform necessary skills, and can apply concepts to solve problems. These assessments will be the great majority of students' grades each session. Students can expect one summative test each session. There may be a few projects or other classroom assignments where students will be asked to apply previous knowledge to real-life tasks or in-depth problems. These assignments may be part of the summative assessment, or may be formative only.

Test Retake Policy

Each student has the option to retake each session test ONCE and will receive the higher score. If you want to retake a test, you must meet these conditions:

- Take the test when it was originally due, and score more than 30% on the test.
- Have all class work/homework/assignments/quizzes from the session complete in student notebook.
- Complete test corrections from the original test. Turn in these corrections and your original test to me.
- Schedule a time to retake the test, or retake during homework club.

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Session	Learning Target	Formative	Summative
1 Power Standards 1, 11	Linear Equations and Inequalities - Model and solve Linear Equations including Inequalities, Absolute Value, and Systems of Equations - Graph Linear Equations - Select and justify a correct model for a problem situation and use that model to solve the problem - Verify Solutions for accuracy - Communicate Solutions in Context using appropriate mathematical representations, symbols, and language. - Select and Apply appropriate Solution Strategies.	- Independent assignments - Notebook	- Pencil and Paper Test - Poster Project
2 Power Standards 7, 8, 11	Relations and Functions - Identify functions and distinguish between relations and functions - Solve problems that include operations, composition, graphs, and inverses of functions. - Describe the effect of different transformations and different size parameters on graphs of functions. - Sketch graphs of functions, connecting the solutions of the equation to the graphs of the function. - Use appropriate mathematical representations, symbols, and language.	- Independent assignments - Notebook	- Pencil and Paper Test
3 Power Standards 1, 3, 4, 10	Quadratics, Part 1 - Use Algebra and the completing the square procedure to fluently translate between the standard, vertex, and factor forms of a quadratic function. - Solve quadratic equations with real or complex roots by factoring, completing the square, or the quadratic formula. - Select and justify a correct model (linear function, systems of linear equations, quadratic function, or exponential functions) for a problem situation and use that model to solve the problem.	- Independent assignments - Notebook	- Pencil and Paper Test - Poster Project
4 Power Standards 1, 3, 4, 10	Quadratics, Part 2 - Use graphing and the discriminant to classify the nature of the roots (rational, irrational, and complex). - Determine whether a two-variable data set is best modeled with linear, quadratic, or exponential function. - Use technology to find a model and make predictions.	- Independent assignments - Notebook	- Pencil and Paper Test

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5 Power Standards 2, 11	Rational, Irrational, and Complex Numbers - Add, subtract, multiply, divide, simplify and evaluate rational algebraic expressions. - Solve problems that include rational numbers. - Solve problems that involve irrational and complex numbers - Solve problems that include imaginary numbers.	- Independent assignments - Notebook	- Pencil and Paper Test - Poster Project
6 Power Standards 8, 11	Polynomial Functions - Sketch graphs and solve square root, inverse variation, and cubic functions; connecting the solutions of the equation to the graphs of the function. - Communicate solutions in context, using appropriate mathematical representations, symbols, and language.	- Independent assignments - Notebook	- Pencil and Paper Test
7 Power Standards 1, 5, 6, 10, 11	Exponents and Logarithms - Select and justify a correct model (linear function, systems of linear equations, quadratic function, or exponential functions) for a problem situation and use that model to solve the problem. - Sketch graphs of exponential functions and their inverse logarithmic graphs - Find logarithm values through examining the inverse exponential graph. - Demonstrate an understanding of inverse relationships. - Use inverse relationship between exponential and logarithmic functions and the properties of exponents and logarithmic functions to solve exponential and logarithmic equations. - Use technology to find a model and make predictions.	- Independent assignments - Notebook	- Pencil and Paper Test - Data Analysis Project
8 Power Standards 2, 11	Rational Expressions and Equations - Add, subtract, multiply, divide, simplify and evaluate rational algebraic expressions. - Select and apply appropriate solution strategies, and verify solutions for accuracy. - Communicate solutions in context.	- Independent assignments - Notebook	- Pencil and Paper Test

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Types of Learning Activities

[This chart demonstrates the types of learning activities the student will complete throughout the course]

Direct Instruction	Indirect Instruction	Experiential Learning	Independent Study	Interactive Instruction
<input checked="" type="checkbox"/> Structured Overview <input checked="" type="checkbox"/> Mini presentation <input checked="" type="checkbox"/> Drill & Practice <input checked="" type="checkbox"/> Demonstrations <input type="checkbox"/> Other (List)	<input checked="" type="checkbox"/> Problem-based <input type="checkbox"/> Case Studies <input checked="" type="checkbox"/> Inquiry <input checked="" type="checkbox"/> Reflective Practice <input checked="" type="checkbox"/> Project <input checked="" type="checkbox"/> Paper <input type="checkbox"/> Concept Mapping <input type="checkbox"/> Other (List)	<input type="checkbox"/> Virt. Field Trip <input type="checkbox"/> Experiments <input type="checkbox"/> Simulations <input type="checkbox"/> Games <input type="checkbox"/> Field Observ. <input type="checkbox"/> Role-playing <input type="checkbox"/> Model Bldg. <input type="checkbox"/> Surveys <input type="checkbox"/> Other (List)	<input type="checkbox"/> Essays <input checked="" type="checkbox"/> Self-paced computer <input type="checkbox"/> Journals <input type="checkbox"/> Learning Logs <input checked="" type="checkbox"/> Reports <input type="checkbox"/> Directed Study <input checked="" type="checkbox"/> Research Projects <input type="checkbox"/> Other (List)	<input type="checkbox"/> Discussion <input type="checkbox"/> Debates <input type="checkbox"/> Role Playing <input type="checkbox"/> Panels <input checked="" type="checkbox"/> Peer Partner Learning <input type="checkbox"/> Project team <input type="checkbox"/> Laboratory Groups <input checked="" type="checkbox"/> Think, Pair, Share <input checked="" type="checkbox"/> Cooperative Learning <input type="checkbox"/> Tutorial Groups <input type="checkbox"/> Interviewing <input type="checkbox"/> Conferencing <input type="checkbox"/> Other (List)

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Formative Assessments

Your formative assessment will be your ongoing demonstration of your ability to become proficient with the learning target for the session. All formative assessments will be completed in the Cognitive Tutor workbooks or in the student notebooks that are to be kept in class.

Formative Assessments:

- **Daily Warm-Up problems**
- **Daily Concept Notes**
- **Daily Example Problems**
- **Daily Pair or Group Practice**
- **Daily Individual Practice**
- **Daily Homework**

Weekly Student Notebook Checks

Weekly Quizzes

End of session Review

Computer Lab Checks

Lab check off 1 (mid-session)
Lab check off 2 (end of session)

Sample Classroom Day:

Warm up
Small investigation – just try it!
Concept Instruction – take notes
Example problems – take notes
Practice: Guided practice
 Pair or group practice
 Individual practice
Cognitive Tutor Work
Final Assessment – exit slip or final problem(s)
Thursday – Weekly quiz with results

Summative Assessments

Each Session, students will complete a summative assessment option. **This assessment will formally demonstrate whether the student is proficient with the learning target for the session.**

Examples of Summative assessment options used:

Paper & Pencil TEST

Paper and pencil test with extended answer problems, some multiple choice. **NO RETAKES ALLOWED UNLESS ALL OTHER WORK IS COMPLETED FOR SESSION.**

Poster Project or Powerpoint presentation

Complete two extended problems as a PowerPoint, including necessary graphs, tables, pictures, equations, and statement of problem. Graphing calculator data will be uploaded to PowerPoint as part of the demonstration. Must present to class or instructor in a proficient manner.

One on one problem solving demonstration

Complete two extended problems in presence of instructor, using oral and written methods to demonstrate mastery of standards.

****Cognitive Tutor Computer Work**

As part of ANY summative assessment choice, the student must have earned enough cognitive tutor units or hours to account for the amount of class time used for the computer program. If a student is absent, or chooses not to work during class, he/she will need to make up the time outside of class. OR, the student will have progressed through a pre-determined number of units during the session, according to the rubric in this syllabus.

Notebook work

Maintain a portfolio throughout the session, exhibiting student notes, work, quizzes, projects, and test. Work will be kept in students' notebook, and projects/special assignments will be attached. The student will submit this prior to the end of the session at a pre-determined due date, and the instructor will make recommendations for needed changes. If necessary, the student will then re-submit in order to demonstrate proficiency of the standard. This includes a final assessment that can be re-taken.

Cognitive Tutor Portion

We will spend a lot of time working math on Cognitive Tutor. There is no test for this work, as the computer software is constantly assessing and showing when errors are made, and when proficiency is met, the program allows the student to move on. Please see the detailed which spells out the Cognitive Tutor portion of the students' grade.

COGNITIVE TUTOR RUBRIC FOR CLASSES (NOT MATHLAB)

(Cognitive Tutor part of every session)

A = 100%	B = 85%	C = 70%	NC = 0%
The student completed at least 4 units OR The student spent at least 6 hours on the tutor and completed 60 problems.	The student completed at least 3 units OR The student spent at least 5 hours on the tutor and completed 50 problems.	The student completed at least 2 units OR The student spent at least 4 hours on the tutor and completed 40 problems.	The student completed less than 2 units OR The student spent less than 4 hours on the tutor and did not complete 40 problems.
The student was never off task or a disruption in the lab.	The student was occasionally off task or a disruption in the lab ($\leq 5\%$ of the time).	The student was often off task or a disruption in the lab ($\leq 20\%$ of the time).	The student was almost always off task or a disruption in the lab ($\geq 50\%$ of the time).

Cognitive Tutor Math Portion:

- **Good Practice (practice & repetition is a huge part of success in math)**
- **Differentiated instruction & Practice, Instant results & feedback**
- **Individualized, Work at own pace**

Lab Expectations

- **Lab time:** Start on time - 3 minutes to get set up: Get logged in to cognitive tutor program, get music ready, check email, etc. No Food or drink allowed in Lab! With one minute left, log out and pack up.
- **Technology:** After set up, avoid any activities not part of cognitive tutor. This includes computer games, surfing the internet, laptop use, portable game use, cell phone use, etc. After completing a full unit, you get a free 10 minute in-class grace period from these rules! You cannot disrupt others during this period.
- **Communication:** Ask questions! Ask instructor, or classmates. Communicate with me about level of difficulty. Limit conversations to focusing on the math - social conversations are not allowed.
- **Violations of Lab Expectations:** You will get one warning, and then you will not be allowed to use the computers in the lab until you meet with the principal. Your parent will also receive a phone call. A third violation could result in suspension or removal from the class.



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Justin's Expectations

- (1) **Respect:** At all times you are expected to be courteous to your teacher and classmates and to always be positive. This includes the language you use, but also the tone and intent of your words. You are also expected to be very quiet and respectful when the teacher or another student is trying to talk to the class. If the instructor makes a request of a student for the benefit of the learning environment, the student is expected to be cooperative. **All LWSD and school rules and consequences apply inside the classroom. Violations will result in meeting with the principal and/or immediate removal from class. Copying:** During a summative assessment, or completing individual work, copying another person's work is cheating, and will not be tolerated. Letting someone else copy your work is also cheating, and will not be tolerated.
- (2) **Intention:** If you intend to work on and learn math you are most welcome, however, if you intend not to, then you must arrange for an alternate option so that everyone has an opportunity to learn.
- (3) **Be prepared:** During passing period, and during the first two minutes of class is the time to sharpen your pencil, get your notebook, textbooks, start your warm up, get logged into the computer in the lab, and to be settled. If you do not have a pencil, borrow one from a friend or get one from the office. **If you are late, go to the office first to get a tardy pass. When late, do not disrupt the class by talking or being loud. If you are 10 minutes late, you will be marked absent. Do not interrupt the class because you are late, wait until a break to ask to get caught up.**
- (4) **Class time:** You are expected to have your work out and be actively working and learning. The warm up, or other instructions will be posted on the board, and it is your responsibility to be on task at the very beginning of class. Bathroom breaks will not be permitted during the first 15 minutes of class. During the last 1 minute of class, you are expected to put away tools, text books, calculators, log out, etc. Leaving class without permission is not tolerated, and you will be marked absent and need to meet with the principal.
- (5) **Computer Use:** In the lab, computers are reserved for the cognitive tutor math program only. After the first three minutes of class, the computers must only be used for these appropriate reasons. Check your email and get your music ready during that first 3 minutes! After one warning, violating this guideline will result in the loss of computer privileges until meeting with the principal.
- (6) **Cell phones:** Any use of cell phones is strictly prohibited in the classroom or lab. This includes making and receiving phone calls at any time. It also includes using the phone for internet or texting during instruction or group work and whole class work. If you violate this policy, you will only receive one warning during the school year, and then the phone will be confiscated, and can be retrieved at the end of class. If violated again, the phone can only be received by meeting with the principal.
- (7) **Music & Volume:** Music is encouraged if it helps you focus, but you must use it with headphones so nobody else can hear it. During times of instruction, group work, and class discussion, music must be off. You are expected to remain relatively quiet during all times in the lab and classroom. Many times we work in groups, and it is important that you focus your communication in a math-related way. Other conversations should not be present during class time.
- (8) **Food & Cosmetics:** There will be no food or drink allowed in the lab. In the classroom, snacks are permissible. Hot food and full meals are not allowed as they are very distracting and messy. Lastly, make-up, perfume, or other cosmetic items are not allowed to be out in the lab or classroom.
- (9) I have read, and I understand these classroom expectations, and I will try my best to abide by them and encourage others to do so as well. I agree that by disregarding any of these guidelines that I will receive consequences for my actions. These include one warning for the school year, then confiscation of any disruptive items. They may also include removal from class, meeting with principal, parent notification, suspension, and complete withdrawal from the class.

Student Signature

Date

Parent Signature

Date

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