Algebra 2 College Prep Syllabus - Mr. Callahan

Knottareal High School

Introduction and Welcome

Welcome to Algebra 2! My name is Mr. Callahan, and I'm really excited for the opportunity to work with you this year as you continue to develop your quantitative problem-solving and rational thinking skills. At some point in the last few years, you mastered the fundamental skills of algebraic equations and graphing in Algebra 1. In Algebra 2, we will review, refine, and expand upon these skills to build a cohesive understanding of functions, manipulations, graphing techniques, data analysis, and real-world modeling. Personally, I hope that our work in this class will also help you reflect on and feel accomplished with how much math you have learned so far and will have learned by the end!

This document outlines the course goals, calendar, policies, and grading scheme that will be essential for a productive, learning-filled, and hopefully fun semester. After reading it over, please complete the online quiz (in Google Forms) to signal your understanding and agreement with the syllabus. [You may work in groups and refer to the syllabus while taking this quiz.] I'll be walking around to answer any questions. I look forward to chatting with you more and learning together for the next ten months!

Best,
Mr. Callahan

Fast Facts

Classroom Location - Room 272

(Circle one) Our class meets during period A B D

Teacher - Mr. James Callahan (he/him)

Website - www.knottarealschool.edu/sites/jcallahan272

I update my site daily with classwork, homework, and announcements. If you are unsure about something (or if you are absent from class and need to find what you missed), please check there first!

Email - callahan.james272@knottarealschool.edu

I will make every effort to respond to email daily. Please send a follow-up email if you do not hear from me within 36 hours, except during holidays when my response times may be longer.

Part 1: Course Learning Goals

By the end of this class, you (the student) will be able to…

- …perform arithmetic, simplification, factoring, and other manipulations on rational/real/complex numbers and polynomials.
- …describe the basic characteristics of linear, quadratic, polynomial, rational, radical, exponential, logarithmic, and trigonometric functions.
- …compare and contrast families of functions using graphs and equations.
- …use inverse operations, graphing, and other standard algorithms to solve equations of one or more variables.
- …translate real-life situations into algebraic models that can be approximately or exactly solved via the above techniques.
- …apply techniques of algebra to novel contexts and other subjects.
- …collect, analyze, and explain data using standard statistical measures and principles of probability.
- …self-assess your mastery of math and target areas for improvement via self-reflection.

Throughout this class, you (the student) will also…

- …advance your ability to problem solve, fostering the understanding that…
    - …productively struggling through difficult problems is a good thing and a sign of learning.
    - …questions may have multiple possible paths available to reach a solution.
- …develop your proficiency in clearly communicating mathematical ideas to your peers.
- …understand the value of rational thinking as one tool of many for facing life's challenges.

Part 2: Class Components

Prepared for Class

Every day in class you need to bring

- Pencils
- Graph Paper and Looseleaf Paper
- Graphing Calculator
- Folder with the previous day/night's exercises, formula sheet

You will need to buy at least a 1.5 inch binder for your math portfolio at the start of the year, but it will stay in the classroom (see Part 4 below).

In-Class Time

Though I will sometimes present material at the board, **math is best learned by doing problems**. To this end, much of the class will revolve around working on exercises alone, in pairs, or in small groups.

Typically, class will have two parts: the lesson and time for exercises.

- *The Lesson:* We will work together as a class to go over the new material for the day (or dive deeper into material from the previous day).
- *The Exercises:* I will assign exercises from the book or a separate handout. Each day you will complete the **Foundational** exercises and then one or more sets of **Growth** Exercise Sets:
    - **Foundational**- These exercises are **mandatory** for everyone and should be able to be completed during class on most days. They serve as the foundation of the class and ensure that you are learning the core learning objectives of the class. Tests and quizzes have problems at this level.
    - **Growth**- Each day after you have completed the Foundational exercises, ***you get to choose*** which of the Growth Exercise Sets to complete, based on your individual needs. Most days, you'll be able to pick from the following:
        - ***Practice***- these reinforce concepts from the current lesson.
        - ***Review***- these are from earlier lessons and are designed to help you keep old concepts fresh.
        - ***Challenge***- these are more complex and are designed to help you dive deeper into the underlying math. They are mainly reserved for students who feel confident in their understanding of the lesson and want a challenge.
- For the *exercises* part of class, you can work with 0-3 other people to go through the exercises. If you choose to work in a group, you are still expected to independently write down your answers and complete your work. ***[Having one person do the exercises and everyone else copying them is not allowed.]*** I will be circling around the class, answering questions, and making sure that everyone is on task. Occasionally, if many students are struggling with a particular concept, I will work through a Foundational Problem with everyone who wants to listen at the board.

[Note: You do <u>not</u> need to complete all of the exercises for a particular day, except for the *Foundational* ones which are mandatory. See the "Math Portfolio Rubric" in Part 4 for details.]

On-Task

In the Math Portfolio Rubric of Part 4, you'll notice that part of that part of your grade is determined by how much you are "on-task". Behaviors that constitute being on-task include:

- Working on exercises quietly alone
- Working on exercises in a group and keeping conversations centered around math

- Listening and taking notes if a larger group and I (the instructor) are going over problems on the board
- Adding to your notes while solving exercises

Behaviors that are **not** on-task include:

- Excessive bathroom breaks (using them to text, chat with friends in the hall, or wander the school)
- Working on homework from another class
- Doing work for an after-school activity
- Distracting other students
- Eating an extremely messy plate of powdered donuts
- Browsing social media and texting
- Consistently not coming prepared for class
- Looking up the answers without first solving the exercise
- Copying from other students or the answer key

Homework

My expectations for homework are the following:

You spend ~10 minutes per night working on exercises

+

You complete at least 1 exercise

↓

Regardless of how many exercises you completed in class

My homework policy is based on the principles of *spaced retrieval practice*. Basically, our brains learn better if we do a few exercises every so often instead of a ton of exercises all at once. Homework gives your brain a small "test" at some point of the day that isn't math class, and doing this every day will help your brain consolidate ideas when you aren't doing math. It is kind of like building up a muscle.

Homework is just a continuation of the exercises from class, just done at a different time than class. So you can do them in study hall, at home, in the morning- whenever you find a spare 10 minutes to focus and get some "math exercise" done. You may also choose to do more homework, but for many students this isn't necessary. Spend that time helping to cook dinner, playing sports, working a part-time job, or whatever else you do outside of school!

In Case of Absence

If you are absent due to sickness or other extenuating circumstances, you will still be responsible for any material taught in class on quizzes/tests/etc. If you have trouble learning the material on your own, you can ask a friend to help you catch up, meet with me after school to go over the main points and practice some exercises, go through the relevant part of the textbook on your own, and/or use online resources such as Khan Academy for the missed lesson. If you miss class due to a field trip/sports event, deadlines will only be extended in rare cases.

You are required to email/talk to me about a plan for making up the work you have missed: the purpose of this communication is so that together we can come to a reasonable timeline for making the work up. Usually this will entail completing the missed math portfolio problems.

Reflection & Feedback

Several times during the course, I will ask you to reflect on your progress. A regular habit of thinking about your thinking, a process called ***metacognition***, is known to help you improve both your study skills and your understanding of the material.

In a similar vein, I am always looking to improve my teaching and try to reflect on my own growth as a teacher regularly. On a few days during the school year, other teachers or administrators may come to my classroom and observe, then offer me positive/constructive feedback in a 1-on-1 meeting. However, as students who see me teach every day, I consider **you** to also be a valuable source of feedback. At several points during the year, I will ask for your feedback on my teaching anonymously using a Google Form. I will then share the major numerical results with the class and share my comments to see how we can make the class even better together!

Respect & Teamwork

Respect and teamwork are **mandatory** in my classroom and in all interactions surrounding my class.

- ***Respect***: Each person will respect every other person. Bullying and mean-spirited comments will not be tolerated.
- ***Teamwork***: You and your classmates are on a team, helping each other learn and learning from each other. You will be expected to be a good team player in this class. Assisting other students in understanding the material will be highly valued. On the other hand, cheating is **not** being a good team player: cheating hurts the learning of other students and will not be tolerated.

Part 3: General Expectations

In order to make our class a safe, respectful, collaborative learning environment where all students are welcome and can achieve their potential, everyone involved must work together to play their part. As a high school student, the team that supports your learning is made up of your parents/guardians, teachers, guidance counselors, administrators, other school staff and your classmates. Below please find the general responsibilities that students, parents, and I myself have for allowing productive learning to happen.

Everyone is expected to…

- …communicate in a respectful and timely manner to everyone else.
- …respect all members of the Knottareal High School educational community.

As the **instructor**, I am expected (and excited) to…

- …set out clear course expectations for students based on learning objectives, align assignments and assessments with these learning objectives, and notify students of any changes in a reasonable and timely manner.
- …guide students in developing their respective critical thinking skills, analytical skills, and fluency with the field of mathematics.
- …provide students with meaningful, relevant, timely, and accessible feedback that they can use to grow as rational thinkers, global citizens, and scholars of mathematics.
- …help all students to appreciate the importance and beauty of mathematical thinking both within and beyond the course's subject material.

Students are expected to…

- …keep up-to-date on assignment/assessment deadlines and course expectations.
- …devote time and effort towards advancing your critical thinking skills, analytical skills, and fluency with the field of mathematics.
- …grow as rational thinkers, global citizens, and scholars of mathematics both by engaging with assignments/assessments and reflecting on their own learning.
- …work together with other students when appropriate to help each other meet our collective scholarly goals.

Parents/guardians are expected to…

- …encourage critical, rational thinking and positive self-talk around mathematics in the home environment.
- …contact the instructor (me) with any concerns, comments, and/or questions in a respectful manner.

Part 4: Grades

Math Portfolio

I will check your progress through the class material and evaluate your classwork/homework via your ***math portfolio***, a binder collection of your classwork and homework. In order to save you space in your backpack, *you will leave your binder in my classroom* and only need to bring the most recent papers that you are working on to/from class. Exercises from each day should be clearly labeled with your name and the date; you will then fill your binder in *reverse chronological order*, so that **the oldest day of exercises is on the bottom and the newest day of exercises is on top**. Finally, each day you will fill out the "Table of Contents" for your portfolio, copies of which can be downloaded from my website or picked up in my classroom. The Table of Contents should list the **date** each set of exercises were assigned, as well as **which exercises (sections and numbers)** you completed from that set in class and for homework, as shown in this example:

Date	Sec.	In-Class	At-Home
7/30/22	2.3	#5-19 odd, 28, 30, 37	—
	1.4	#49, 51	#6,8,10
7/31/22	…	…	…

[*Note:* Absent? Leave two lines blank per absent day to be filled in later.]

I will check the portfolios roughly **every four classes**, but I will only check for work that should have been completed two classes ago. So, for example…

Tuesday	**Wednesday**	**Thursday**	**Friday (no class)**	***Monday***	**Tuesday**	**Wednesday**
	Let's assume that the last time I graded them was after class today.	1…	(This day doesn't count because we didn't have class.)	2…	3…	4… So after class today, I will check all the way up through ***Monday's exercises.***

[I will also post which day I will be collecting them in my room and on my website for each class.]

The following rubric will be used in evaluating your portfolio. Though not shown below, *turning in work that is not your own* will result in a low grade.

Math Portfolio Rubric	You were **pretty much always** (90-100% of the time) on-task during class. You completed 10 minutes of homework each night.	You were **often** (75-90% of the time) on-task during class. You completed 5-10 minutes of homework at least some nights.	You were **frequently off-task** (25% of the time or more) during class.
You have completed all **Foundational** exercises, *and* roughly two or more sets of **Growth** exercises per day.	100	90	75
You have completed all **Foundational** exercises, *and* roughly one set of **Growth** exercises per day.	90-95	80-85	70
You have completed all **Foundational** exercises.	85	75	60
You have <u>not</u> completed all **Foundational** exercises.	I*	60*-70*	50**

I = Incomplete Grade, that may be re-evaluated in a future week

*If you are staying on task in class (and doing 10-20 minutes of homework each night) and not completing the foundational problems, I will work with you and your educational team to come up with a study plan so that you do not fall behind.

**If you are not staying on task in class and not completing the Foundational problems, I will be communicating with your parent(s)/guardian(s) and/or guidance counselor to discuss how your behavior is negatively impacting your academics.

Cumulative Quizzes

Math is a cumulative subject. In every quarter, we will have 3 cumulative quizzes. You will be allowed to use a calculator, the textbook, your notes, and your binder during the quiz. These will be short (15-20 minutes) and timed. You may re-attempt each cumulative quiz once by coordinating a time with me after school or during a block that you and I both have free.

Tests

We will have roughly 3 tests per quarter. Each test will focus on the subjects covered before the last test. However, due to the fact that material builds on itself, some skills from earlier parts of the course may be required. Questions will ask you to *remember*, *apply*, and *put together* concepts, similar in level to the **Foundational** exercises in class. Tests are timed, and you will be allowed to use the class formula sheet.

The midterm and final exams will be cumulative, with slightly more focus on recent material that hasn't been tested. Otherwise, they will be worth the same as other tests during the quarter and will have the same types of questions.

Test Post-Mortem

Tests are a measure of how well you have learned the material at *one moment in time*, and are an *imperfect* measure of your abilities. They are also an opportunity to learn and deepen your understanding of the material. To help with this learning, on the day you receive the test back, everyone will work on a special set of exercises called a **test post-mortem.**

- ➔ *Test reflections* will count as **Foundational** exercises and are mandatory. Here you will reflect on your learning over the past several weeks and whether or not that was accurately represented on the test. This will take approximately 10-15 minutes
- ➔ *Test corrections* will count as **Growth** exercises, and are recommended for anyone who received less than a 75%. Through these, you will be able to show growth in learning the material by re-attempting the problems that you missed (or similar problems) in a less anxiety-producing setting.
  - ◆ ***Through test corrections, you can earn back up to double your score or 80%, whichever is lower.***
  - ◆ Example 1: if you earned a 35%, you could get back an additional 35% via test corrections for a final score of 70%.
  - ◆ Example 2: if you earned a 60%, you could get back an additional 20% via test corrections for a final score of 80%.
  - ◆ Example 3: if you earned a 90%, you are ineligible to receive points back via test corrections and have a final score of 90%.
- ➔ Additional **Growth** exercises will also be available, and are recommended for anyone who received greater than a 90%. These will serve to give a deeper review of the material or to help you take your knowledge to the next level, respectively.

[*Note*: There will be a post-mortem for the midterm exam, but not for the final exam.]

Overall Course Grade

Your course grade will be calculated every quarter using the following percentages:

- **35% -** *Math Portfolio* (Exercises done in class and at home, including test post-mortems + keeping an organized binder)
- **12% -** *Cumulative Quizzes*
- **53% -** *Tests* (including the Midterm and Final Exams; with test post-mortem corrections factored in)

So for example, if you scored an average of **85** on the *Math Portfolios* throughout the quarter, an average of **65** (after retakes are factored in) on the *Cumulative Quizzes*, and worked on the post-mortems enough to get an **80** average on the *Tests*, you would get an **80 (B)** for the quarter.

Part 5: Problem-Solving Policies

- **Show all of your work.** You should aim to clearly communicate/show, using equations and/or words, the quantitative analysis and mathematics knowledge needed to solve each problem in this class. Partial credit will be given for written-out steps in the right direction even if the ultimate answer is wrong. Full credit will ***not*** be given for writing the answer to a problem *without* showing work.
- **Be neat.** In order for me to give you the maximum amount of credit possible, I need to be able to read what you have written.
- **Be concise.** Oftentimes exercises may take a few attempts, and that is a healthy and normal part of the learning process! However, please make it clear to me what the final solution is that you want graded.
- **It's OK to be a bit informal.** Use *common* abbreviations for words if you want. If you solve a problem correctly but still don't understand one step, feel free to ask a question in the margin. If I don't see it while grading, please bring it to my attention after you receive the assignment back so I may address it.

Academic Integrity

I have purposefully structured this class to give you many opportunities to showcase your own learning flexibly through the math portfolio as well as gaining points back on assessments. I hope that these lower stakes will prevent you from turning to academic dishonesty throughout the year. However, any student caught cheating will go through discipline according to the *school-wide policies on cheating* found in the schools' student handbook. **Cheating** includes but is not limited to: rote copying of any part of a problem from another person/online source/the answer key, handing in someone else's work claiming it as your own, communicating test/quiz answers to other students, asking for test/quiz answers from other students, and plagiarism.

Part 6: Rough Course Calendar

Please note that the following calendar is subject to change due to unforeseen weather events, public health measures, etc.

- **Quarter 1** - Linear Equations/Inequalities/Functions, including a review of Algebra 1
  - Roughly Chapters 1-3
- **Quarter 2** - Quadratic and Other Polynomial Equations/Inequalities/Functions, Factoring Techniques, Complex Numbers, The Fundamental Theorem of Algebra, Probability
  - Roughly Chapters 4-5 and part of Chapter 11
- **Quarter 3** - Radical/Exponential/Logarithmic Equations and Functions, Sequences and Series
  - Roughly Chapters 6-7 and Chapter 9
- **Quarter 4** - Rational/Trigonometric Functions, Statistical Methods for Analyzing Data
  - Roughly Chapters 8, 13, and part of Chapter 11