Math 111Z Syllabus TDHS/Dual Credit CGCC

Pre-Calculus 1 - Functions

Instructor: Cory Erickson
Credits: 4

Grading Period: Aug 29 - Nov 17

Contact Info:
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Textbook and Materials

- *All things Algebra, Gina Wilson*
- PreCalculus (Common Core Edition) 1st edition. Carter, Cuevas, Day, Malloy (TDHS)
- Graphing Calculator

Course Description

This course examines relations and functions graphically, numerically, symbolically and verbally. Functions and applications studied are exponential, logarithmic, power, polynomial and rational functions. Placement test scores and teacher recommendations are required.

Intended Outcomes for the course

• Explore the concept of function numerically, symbolically, verbally, and graphically and identify properties of functions both with and without technology.

• Analyze polynomial, rational, exponential, and logarithmic functions, as well as piecewise-defined functions, in both algebraic and graphical contexts, and solve equations involving these function types.

• Demonstrate algebraic and graphical competence in the use and application of functions including notation, evaluation, domain/range, algebraic operations & composition, inverses, transformations, symmetry, rate of change, extrema, intercepts, asymptotes, and other behavior.

• Use variables and functions to represent unknown quantities, create models, find solutions, and communicate an interpretation of the results.

• Determine the reasonableness and implications of mathematical methods, solutions, and approximations in context,

Institutional Learning Outcomes

Through their respective disciplines, CGCC students who earn a degree can:

1. Communicate effectively using appropriate reading, writing, listening, and speaking skills *(Communication).*

2. Creatively solve problems by using relevant methods of research, personal reflection, reasoning, and evaluation of information *(Critical thinking and Problem-Solving).*
3. Extract, interpret, evaluate, communicate and apply quantitative information and methods to solve problems, evaluate claims, and support decisions in their academic, professional and private lives *(Quantitative Literacy).*
4. Recognize the consequences of human activity upon our social and natural world *(Community and Environmental Responsibility).*

Classroom Expectations

- Absent students should communicate with the instructor about missed instruction.
- Missed exams are not made up during class time.
- Students are expected to take part in all learning opportunities during class sessions.

**** CELL PHONES AND OTHER ELECTRONIC DEVICES In order to limit class disruptions, all cell phones and personal electronics must be turned off and remain out of sight during instructional time. Students are only permitted to use devices on school property before and after school, during passing times, and designated lunch times. Any student who needs to use a phone during instructional time may use a school phone in the main office with permission. Cell phones/electronics shall not be used in a manner that disrupts the educational process, school programs or activities, or in a manner that violates law, board policy, administrative regulation, or school rules.****

If a student accesses his/her phone during class time, the following will occur:

• Teacher will instruct the student to report to the student discipline office or main office

• Student will deliver powered-off phone to student discipline office or main office • 1st offence - The student may retrieve their phone from the student discipline office at the end of the school day.

• 2nd offence - The student will need the parent or guardian to retrieve the phone from the office. Parent may pick up the phone at any time during school hours.

• If student refuses to report to the office or to deliver the phone as per policy, the student will be suspended out of school for one day.

• If a student violates the policy but with another student's phone, the same process and consequences apply to the student in possession of the phone.

• 3 or more offences the student will be subject to a longer suspension for disruption of the educational environment.

Evaluation and Grading

10 % - Assignments including any work to be done at home, completed in class or any activity that needs to be completed at home.

90 %- Quests (quizzes, performance exams and tests)-this will be a combination of tests and quizzes as well as any performance or rich tasks that will be given.

- Students are assessed on exams, homework, quizzes and projects.
- Assignments will be scored regularly and collected at the end of units.
- Projects will be assessed with a rubric that accompanies the assignment.
- There will be 3 unit exams and a final exam.
- in-class instruction, exams comprise roughly 90% of the final grade.
- Scale: **90-100: A 80-89: B 70-79:C 60-69:D Below 60:F**

The course content and requirements may be adjusted in response to institutional, weather, or class situations as needed with adequate notice to students.

Unit 1 - Fundamental Skills: Sample Unit Outline

	TOPIC	HOMEWORK
DAY 1	Exponents and Polynomial Operations	HW #1
DAY 2	Factoring Polynomials	HW #2
DAY 3	Rational Expressions	HW #3
DAY 4	**Quiz 1-1**	None
DAY 5	Radicals and Rational Exponents	HW #4
DAY 6	Complex Numbers	HW #5
DAY 7	**Quiz 1-2**	None
DAY 8	Linear Equations & Absolute Value Equations	HW #6
DAY 9	Quadratic Equations	HW #7
DAY 10	Radical Equations	HW #8
DAY 11	Rational Equations	HW #9
DAY 12	**Quiz 1-3**	None
DAY 13	Inequalities	HW #10
DAY 14	Unit 1 Review	Study For Test
DAY 15	**UNIT 1 TEST**	None

Unit 2 – Functions & Their Graphs: Sample Unit Outline

	TOPIC	HOMEWORK
DAY 1	Functions Review • Representing Relations (Tables, Mappings, Graphs, Equations) • Domain and Range • Relations vs. Functions • Function Notation & Evaluating Functions	HW #1
DAY 2	Intercepts; Zeros; Critical Points (Extrema & Points of Inflection); Increasing & Decreasing Intervals	HW #2
DAY 3	**Quiz 2-1**	None
DAY 4	Continuity; End Behavior	HW #3
DAY 5	Tests for Symmetry; Even and Odd Functions	HW #4
DAY 6	Average Rate of Change	HW #5
DAY 7	**Quiz 2-2**	None
DAY 8	Parent Functions & Transformations	HW #6
DAY 9	Graphing Functions	HW #7
DAY 10	Piecewise Functions	HW #8
DAY 11	**Quiz 2-3**	None
DAY 12	Function Operations & Compositions of Functions	HW #9
DAY 13	Inverse Relations & Functions	HW #10
DAY 14	**Quiz 2-4**	None
DAY 15	Unit 2 Review	Study For Test
DAY 16	**UNIT 2 TEST**	None

Note: The parent functions graphic organizer on Day 8 includes linear, absolute value, quadratic, cubic, square root, cube root, reciprocal, exponential, logarithmic, greatest integer, sine, and cosine. However, only these functions are included when it comes to graphing functions: linear, absolute value, quadratic, cubic, square root, cube root, reciprocal, and greatest integer. This unit focuses primarily on these functions. Other functions will be the focus of later units.

Unit 3 -Polynomial & Rational Functions: Sample Unit Outline

	TOPIC	HOMEWORK
DAY 1	Graphing Power Functions	HW #1
DAY 2	Graphing Power Functions with Rational Exponents (Radical Functions)	HW #2
DAY 3	Graphing Polynomial Functions	HW #3
DAY 4	**Quiz 3-1**	None
DAY 5	Zeros of Polynomials, Linear Factors, and Multiplicity	HW #4
DAY 6	Dividing Polynomials	HW #5
DAY 7	Remainder and Factor Theorems	HW #6
DAY 8	**Quiz 3-2**	None
DAY 9	Rational Zero Theorem; Find Rational Zeros	HW #7
DAY 10	Irrational Zeros; Descartes' Rule of Signs	HW #8
DAY 11	Complex Zeros; Fundamental Theorem of Algebra	HW #9
DAY 12	Using Zeros to Write Polynomial Functions	HW #10
DAY 13	**Quiz 3-3**	None
DAY 14	Graphing Rational Functions	HW #11
DAY 15	Rational Functions with Slant Asymptotes	HW #12
DAY 16	**Quiz 3-4**	None
DAY 17	Nonlinear Inequalities: Polynomial Inequalities	HW #13
DAY 18	Nonlinear Inequalities: Rational Inequalities	↓
DAY 19	Unit 3 Review	Study For Test
DAY 20	**UNIT 3 TEST**	None

Unit 4 – Exponential & Logarithmic Functions: Sample Unit Outline

	TOPIC	HOMEWORK
DAY 1	Graphing Exponential Functions & the Natural Base	HW #1
DAY 2	Transformations of Exponential Functions (vertical and horizontal shifts, vertical and horizontal reflections, vertical and horizontal stretches/compressions)	↓
DAY 3	Exponential Growth & Decay Applications; Logistic Growth Functions	HW #2
DAY 4	Compound Interest & Continuous Compound Interest	HW #3
DAY 5	**Quiz 4-1**	None
DAY 6	Logarithms: Converting between exponential and logarithmic forms, Common Logarithm, Natural Logarithm Evaluating Logs, Change of Base formula	HW #4
DAY 7	Properties of Logarithms, Condensing and Expanding Logarithms	HW #5
DAY 8	Graphing Logarithms	HW #6
DAY 9	**Quiz 4-2**	None
DAY 10	Solving Exponential Equations (using a common base)	HW #7
DAY 11	Solving Logarithmic Equations	HW #8
DAY 12	Solving Exponential Equations using Logs	HW #9
DAY 13	Review Logarithmic & Exponential Equations	HW #10
DAY 14	Applications with Solving Equations	HW #11
DAY 15	**Quiz 4-3**	None
DAY 16	Nonlinear Regression (exponential, power, logistic, logarithmic)	HW #12
DAY 17	Unit 4 Review	Study For Test
DAY 18	**UNIT 4 TEST**	None

Important Dates:

August 29th First Day of School
September 4th Labor DayHoliday – No School.
October 13th State in-service - No sSchool
November 10th Veterans Day – School closed.
November 17th End of Fall term
November 20th, Teacher work day - No School

This syllabus has been read and shared with my parent or legal guardian.

Parent Signature: _____ Date: _____

Student Signature: _____ Date: _____