KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
College of General Studies, Prep-Year Math Program
SYLLABUS: MATH012 – TERM 261

Week	Date	Sec.	Topic
1	Aug. 19 - Aug. 20	MATH 001	1. Factoring and Simplifying Rational Expressions
2	Aug. 23 - Aug. 27		1. Solving Equations: *linear and quadratic.* 2. Solving Equations: *absolute value, and other types of equations.* 3. Solving Inequalities: *linear, quadratic, rational, and other types.*
3	Aug. 30 - Sep. 03		1. Functions: *graphs, combining functions, and transformation of functions* 2. Polynomial functions: *polynomial division, graphs, and complex zeros* 3. Rational functions
4	Sep. 06 - Sep. 10		2.8: One-to-One Functions and Their Inverses 4.1, 4.2: Exponential Functions and The Natural Exponential 4.3: Logarithmic Functions
5	Sep. 13 - Sep. 17		4.4: Laws of Logarithms 4.5: Exponential and Logarithmic Equations
6	Sep. 20 - Sep. 22	5.1	Angle Measure
		5.2	Trigonometry of Right Triangles
		SAUDI NATIONAL DAY: 23RD – 24TH SEPTEMBER 2026	
7	Sep. 27 - Oct. 01	5.3	Trigonometric Functions of Angles
		6.2	Trigonometric Functions of Real Numbers
		6.3	Trigonometric Graphs
MAJOR EXAM I: WEDNESDAY SEPTEMBER 30, 2026 [Math001 + 5.1 – 5.3]			
8	Oct. 04 - Oct. 08	6.3	Trigonometric Graphs…….*continue*
		6.4	More Trigonometric Graphs
		5.4, 6.5	Inverse Trigonometric Functions and their Graphs
9	Oct. 11 - Oct. 15	7.1	Trigonometric Identities
		7.2	Addition and Subtraction Formulas
		7.3	Double-Angle, Half-Angle
10	Oct. 18 - Oct. 19	7.4	Basic Trigonometric Equations
		7.5	More Trigonometric Equations
		MID–TERM BREAK: 20TH – 22ND OCTOBER 2026	
11	Oct. 25 - Oct. 29	7.5	More Trigonometric Equations……*continue*
		9.1, 9.2	Vectors in Two Dimensions & The Dot Product
		10.1	Systems of Linear Equations in Two Variables
12	Nov. 01 - Nov. 05	10.1	Systems of Linear Equations in Two Variables…..*continue*
		10.4	Systems of Nonlinear Equations
		11.1	Matrices and Systems of Linear Equations
13	Nov. 08 - Nov. 12	11.2	The Algebra of Matrices
		11.3	Inverses of Matrices and Matrix Equations
		11.4	Determinants + Properties of Determinants
MAJOR EXAM II: WEDNESDAY NOVEMBER 11, 2026 [6.2 – 11.1]			
14	Nov. 15 - Nov. 19	12.1	Parabolas (*with shifted Parabolas*)
		12.2	Ellipses (*with shifted Ellipses*)
		12.3	Hyperbolas (*with shifted Hyperbolas*)
15	Nov. 24 - Nov. 26	**AUTUMN BREAK: 22ND – 23RD NOVEMBER 2026**	
		12.4	*Shifted Conic Sessions*
		13.1	Sequences and Summation Notation
16	Nov. 29 - Dec. 03	13.1	Sequences and Summation Notation…….*continue*
		13.2	Arithmetic Sequences
		13.3	Geometric Sequences
17	Dec. 06 - Dec. 10	13.3	Geometric Sequences…..*continue*
		Rev	*Review for Final Exam*
FINAL EXAM: TO BE ANNOUNCED [5.1 – 13.3]			

MATH 012

College Algebra and Trigonometry III

COURSE DESCRIPTION

The third course in the Preparatory Year Math Program is Math 012 (College Algebra and Trigonometry III), which covers standard college algebra and trigonometry topics along with advanced topics in college algebra. The course is designed and planned for students who score a grade of 50% or above on the Math 001 placement test, as well as for students who did not pass the promotion requirement for Math 002.

The course is designed to teach students the concepts of College Algebra and Trigonometry over 15 weeks (4 weeks to review and teach the concepts of Math 001, and 11 weeks to teach the concepts of Math 002).

The program aims to:

1. Reinforce and review the student's knowledge of mathematical and analytical skills through the medium of English.
2. Develop the student's writing skills in mathematics through interrelated logical procedures.
3. Provide students with the ability to use their understanding to produce and communicate mathematics.
4. Prepare students to apply mathematics skills in advanced degree programs.
5. Prepare students to acquire a solid foundation in algebra and trigonometry.
6. Shape students' mathematics study habits by emphasizing useful study habits and skills that will facilitate their academic success at KFUPM.

The program is designed such that students are continuously involved in lectures, class work, and self-learning activities, mainly solving problems during recitation classes and through weekly online assignments and knowledge tests, enabling them to master course topics through a continuous cycle of mastery, knowledge retention, and positive feedback. Peer tutoring is an essential component of the learning process; weekly in-person and online training sessions are conducted in which students can enhance their knowledge and exchange ideas with fellow students and instructors. Moreover, students can benefit from resources made available through the LMS (Blackboard) by their instructors and the Prep-Math Program.

PREREQUISITE

Placement test score for MATH 001: 50% or more

LEARNING OUTCOMES

Upon completion of the Prep-Year Math 012 course, a student should be able to:

1. Solve equations and inequalities involving linear, nonlinear, absolute value, exponential, logarithmic, trigonometric, and systems of equations.
2. Perform algebraic operations on real and complex numbers, algebraic expressions, functions, vectors, and matrices.
3. Apply the Fundamental Theorem of Algebra and related theorems to analyze and solve polynomial equations.
4. Analyze and apply functions, including one-to-one, inverse, exponential, logarithmic, and trigonometric functions, and use relevant identities to simplify and evaluate expressions.
5. Sketch and analyze graphs of equations and functions, particularly polynomial, exponential, logarithmic, trigonometric, and inverse functions, and interpret their key properties.
6. Determine equations and analyze the properties of conic sections, including circles, parabolas, ellipses, and hyperbolas.
7. Analyze sequences and series, including arithmetic and geometric sequences and their sums, and formulate mathematical models for real-life problems.

SKILLS AND VALUES

1. Critical Thinking
2. Problem-Solving
3. Team-Work
4. E-Learning
5. Self-Confidence
6. Cooperation

STUDY RESOURCES

1. Textbook examples and exercises.
2. Lecture notes.
3. Homework (ALEKS) through Blackboard.
4. Old exam questions.
5. Online video courses.

Important study resources are available on the Prep-Math Program link on Blackboard (BB).

RULES AND REGULATIONS

Attendance

- Every 5 registered late arrivals will convert into 1 absence.
- A student is registered absent from a class if he joins after 10 minutes or does not attend.
- A student is registered as late for a class if he joins within the first 10 minutes of the class time.
- A student will receive a 1st warning upon reaching 3 unexcused absences.
- A student will receive a 2nd warning upon reaching 6 unexcused absences.
- A student will be awarded a 'DN' grade upon reaching 8 unexcused absences.
- A student will be awarded a 'DN' grade upon reaching 11 total absences.
- Starting from the fifth absence, ½ point will be deducted from the student's total grade for each subsequent absence.
- It is the responsibility of the student to keep a record of his absences. Students have only one week to submit official excuses to the Office of the Assistant Dean, Prep Year Affairs.
- **If a student uses a mobile phone for non-academic purposes (learning use must be directed by the instructor), he/she will be considered absent.**

Missing an Exam

No makeup exam will be given under any circumstance. When a student misses Exam I or Exam II for a legitimate reason (such as a medical emergency), his grade for that exam will be determined based on the Department's policy. Furthermore, the student must provide an official excuse within one week of the missed exam. The same policy applies to quizzes and class tests.

Change of Section

- Change of section is NOT allowed.

Passing and Failing Rules

- The passing grade is "D."

Lectures and Recitation

Three lectures and one recitation per week (50 minutes each). In the recitation class, students should interact with their instructor to solve recitation questions related to the material covered in lectures.

GRADES AND ASSESSMENT POLICY

No.	Math 012 — Assessment and Grades Policy	Total Weight
1	Class-Work • 5 written quizzes (15 points) • 1 written class test (5 points) • Class-work average for each section = x • x = average (Exam I & Exam II) / 20	**20%**
2	Active Learning Activities	**3%**
3	Online Homework on ALEKS	**7%**
4	Major Exam I (20 MCQ)	**20%**
5	Major Exam II (20 MCQ)	**20%**
6	Final Comprehensive Exam (30 MCQ)	**30%**
	Total	**100%**

SERVICES AND EVENTS

- Office hours
- Online video lectures
- Help sessions
- Student Peer Program
- RAM Contest (Real-life Application in Mathematics)
- Factorization Contest
- 1 MBA Contest 2024 (1-Minute Basic Algebra)

TEXTBOOK

Stewart, J., Redlin, L., & Watson, S. Algebra and Trigonometry, Fourth Edition. An online textbook version is available in ALEKS.