

II. COMPASS Cut-off Scores for Mathematics Placement (Effective January 1, 2010)

The COMPASS test is taken once on entrance to determine MTH placement. Students in MTH remediation have opportunities to retest until they achieve proficiency (30 or more in both M1 and M2). However, retests are not used for “re-placement.” Students can skip a required remedial MTH course only by taking and passing the appropriate Departmental final exam.

COMPASS scores by which a freshman may place out of a given course are:

Out of MTH 01: 30 or more on at least one of M1 or M2.

Out of MTH 05: 30 or more on M1 and 45 or more on M2.

Out of MTH 06: 30 or more on M1, 45 or more on M2, and 30 or more on M5 (trigonometry).

Place out of:	Course Table of COMPASS Place Out				
	Arithmetic (M1) (pre-algebra)	Algebra (M2)	College (M3) Algebra	Geometry (S4)	Trigonometry (S5)
MTH 01*	≥30 on either M1 or M2		N/A	N/A	N/A
MTH 05	≥30	≥45	N/A	N/A	N/A
MTH 06	≥30	≥45	N/A	N/A	≥30
MTH 30 or MTH 13**	≥30	≥45	≥45	N/A	≥40

For nursing curriculum codes 003 and 046 and 047:

If $M1 \geq 35$ and $M2 \geq 30$, student is eligible to apply for PHM 10 at Nursing Department.

If $M1 < 30$, student should take MTH 01.

If $30 \leq M1 < 35$, and $M2 \geq 30$, student may retest for M1 after workshop or tutoring.

If $30 \leq M1 < 35$, and $M2 < 30$ then student should take MTH 05.

High School Equivalency (Regents score of 75 or better)

MTH 05 Seq Math II (SMQII): MQ3 and MQ4 [10th grade math] or Math A

MTH 06 Seq Math III (SMQ III): MQ5 and MQ6, or Math B

NOTE: If students have taken advanced algebra in high school and wish to take MTH 31, then they may be exempt from MTH 30 by taking an exemption examination administered by the Department of Mathematics and Computer Science.

Mathematics Course Sequences:

Liberal Arts (non-science)

MTH 01 → MTH 05 → MTH 21 or 23

Mathematics, Science, Technology and Business (transfer programs)

MTH 01 → MTH 05 → MTH 06 → MTH 30 (or MTH 13)

Curricula Requiring MTH 12 (non-science, non-transfer)

Entering with COMPASS proficiency ($M1 \geq 30$ and $M2 \geq 30$): MTH 12

Entering without COMPASS proficiency: MTH 01 → MTH 05 → MTH 12

(Note: MTH 12 is not recommended for transfer to a four year college.)

Exemption Examinations

Qualified students may take exemption examinations for all courses offered by the Mathematics Department upon application to the department. In general, a grade of B+ or better is required for exemption with credit. A passing grade less than B+, but C or better, will qualify for exemption without credit.

MTH 01 4 rec 0 cr

Fundamental Concepts and Skills in Arithmetic and Algebra

Topics selected from basic operations in arithmetic, geometry, verbal problems whose solutions involve arithmetic processes, generalizations of the principles of arithmetic leading to the fundamental concepts of algebra. Elementary treatment of signed numbers and linear equations.

***Prerequisite:** None. Refer to College Curricula Mathematics Requirements and Compass Cut-Off Scores for Mathematics Placement.*

***Corequisite:** RDL 01 if required.*

MTH 04 4 rec 0 cr (Not offered after Spring 2010.)

Selected Topics in 11th Year Mathematics

Topics selected from relations and functions, quadratic equations, systems of equations, coordinate geometry, radicals, geometry, elements of trigonometry.

***Prerequisite:** RDL 02 if required; Liberal Arts (non-science) and Science, Technology and Business (transfer programs) should refer to the Mathematics Placement charts above.*

MTH 05 6 rec 0 cr

Basic Concepts of Mathematics I

Signed numbers, evaluation of algebraic expressions, linear equations and their graphs, polynomials, factoring, radical expressions, quadratic equations.

***Prerequisite:** Math 01 or equivalent and RDL 01 if required. Refer to College Curricula Mathematics Requirements and Compass Cut-Off Scores for Mathematics Placement.*

***Corequisite:** RDL 02 if required.*

MTH 06 6 rec 0 cr

Basic Concepts of Mathematics II

Topics selected from real and complex numbers, function concept, coordinate geometry, linear and quadratic equations, systems of equations, geometry, elements of trigonometry.

***Prerequisite:** MTH 05 or two years of high school mathematics consisting of algebra and geometry or equivalent, and RDL 02 if required.*

MTH 10 4 rec 4 cr

Technical Mathematics I

(For Telecommunications Technology Verizon students only.) First course in a two-semester sequence of intermediate algebra and trigonometry with technical applications. Topics include trigonometry functions, vectors, units of measurement and approximate numbers, fundamental concepts of algebra, functions and graphs, systems of linear equations, determinants, factoring and fractions, quadratics, variation and geometry. A scientific calculator is used throughout the course.

***Prerequisite:** MTH 06 or equivalent and ENG 02 and RDL 02 if required.*

MTH 11 **4 rec 4 cr**

Technical Mathematics II

(For Telecommunications Technology Verizon students only.) Second course in a two-semester sequence of intermediate algebra and trigonometry with technical applications. Topics include trigonometric functions of any angle, oblique triangles, exponents and radicals, graphs of exponential and logarithmic functions, basic operations with complex numbers, inequalities, introduction to statistics. A scientific calculator is used throughout the course.

Prerequisites: MTH 10 or equivalent and ENG 02 and RDL 02 if required.

Any course numbered 12 through 15 is, with some modification, recommended only for those students enrolled in career (A.A.S.) programs.

MTH 12 **3 rec 3 cr**

Introduction to Mathematical Thought

Topics selected from probability, statistics, logic, set theory, geometry, matrices, number system structures. (Not recommended for transfer curricula, and not accepted for credit in the Liberal Arts curriculum.)

Prerequisites: CUNY Math Proficiency as measured by the COMPASS exam, and ENG 02 and RDL 02 if required. Students who have not attained Math Proficiency should refer to College Curricula Mathematics Requirements and Compass Cut-Off Scores for Mathematics Placement.

ENG 02 and RDL 02, if required, are prerequisites for all MTH courses numbered 13 and higher. MTH 13, 14, and 15 are recommended for students in career technology curricula such as Automotive Technology, Electronic Engineering Technology, Medical Laboratory Technology and Telecommunications Technology curricula.

MTH 13 **4 rec 3 cr**

Trigonometry and College Algebra

Vectors, complex numbers, functions and graphs, exponential, logarithmic and trigonometric functions, analytic trigonometry, systems of linear equations.

Prerequisites: MTH 06 or equivalent and ENG 02 and RDL 02 if required.

MTH 14 **3 rec 3 cr**

College Algebra and Introduction to Calculus

Analytic geometry, the derivative and its applications, differentiation of transcendental functions.

Prerequisites: MTH 13 or equivalent and ENG 02 and RDL 02 if required.

MTH 15 **3 rec 3 cr**

Calculus

The integral and its applications, methods of integration, elementary differential equations, expansion of functions in series.

Prerequisites: MTH 14 or equivalent and ENG 02 and RDL 02 if required.

MTH 21, 22, 23 and 26 are non-sequential courses primarily for Liberal Arts students enrolled in non-science transfer programs. MTH 21, 22 and 26 are recommended for Liberal Arts students and as electives for students in other curricula. MTH 23 is recommended for students in such social sciences as economics, political science, psychology, human services and sociology.

MTH 21 **3 rec 3 cr**

Survey of Mathematics I

Designed for non-science liberal arts students. Emphasis on key concepts and structure of mathematics. Topics selected from decimal notation, computation in other bases, groups, sets, logic, elementary number theory, development of real number system, analytic geometry, linear programming, networks, complex numbers.

Prerequisites: MTH 05 or equivalent and ENG 02 and RDL 02 if required.

MTH 22 **3 rec 3 cr**

Survey of Mathematics II

Topics selected from geometry, algebra, graphs, functions, game theory, mathematical induction, permutations, combinations, probability, logic; Euclidean, non-Euclidean, projective, finite, and coordinate geometries; groups, matrices.

Prerequisites: MTH 05 or equivalent and ENG 02 and RDL 02 if required.

MTH 23 **3 rec 3 cr**

Probability and Statistics

Organization and presentation of data, measures of central tendency and variation, correlation and regression, elementary probability, the binomial distribution.

Prerequisites: MTH 05 or equivalent and ENG 02 and RDL 02 if required.

MTH 26 **2 rec 2 lab 3 cr**

Mathematics in the Modern World

Topics selected from BASIC computer language; mathematical simulation of problems from diverse fields including water pollution, population studies, political polls, and artificial intelligence; mathematical algorithms and interpretation of graphs.

Prerequisites: MTH 05 or equivalent and ENG 02 and RDL 02 if required.

MTH 30 through 35 are designed for students majoring in mathematics, physics, biology, chemistry, engineering science, computer science, and are recommended for those in other curricula with advanced preparation.
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MTH 30 **4 rec 4 cr**

Pre-Calculus Mathematics

The relation between a function and its graph, composition and inversion of functions, polynomial, rational, exponential and logarithmic functions, trigonometry.

Prerequisites: MTH 06 or equivalent and ENG 02 and RDL 02 if required.

MTH 31 **6 rec 4 cr**

Analytic Geometry and Calculus I

Limits, rates of change, differentiation and anti-differentiation of algebraic functions, applications, integrals, curve sketching. For Mathematics, Computer Science, and Engineering Science majors, or for Liberal Arts and Sciences students planning to major in one of the physical sciences.

Prerequisites: MTH 30 or equivalent and ENG 02 and RDL 02 if required.

MTH 32 **6 rec 5 cr**

Analytic Geometry and Calculus II

Differentiation and integration of transcendental functions, hyperbolic functions, applications of the definite integral; parametric equations, mean value theorems, polar coordinates, plane analytic geometry.

Prerequisites: MTH 31 or equivalent and ENG 02 and RDL 02 if required.

MTH 33 **5 rec 5 cr**

Analytic Geometry and Calculus III

Vectors, applications of vectors to analytic geometry and calculus, partial differentiation, multiple integrals, volumes and surface area, infinite series, applications.

Prerequisites: MTH 32 or equivalent and ENG 02 and RDL 02 if required.

MTH 34 **4 rec 4 cr**

Differential Equations and Selected Topics in Advanced Calculus

Methods of solving ordinary differential equations; selected topics from among the following: hyperbolic functions, power series, Fourier series, gamma functions, Bessel functions, problems of motion, electric circuits, damped and forced vibrations, Laplace transform.

Prerequisites: MTH 33 or equivalent and ENG 02 and RDL 02 if required.

MTH 35 **4 rec 4 cr**

Selected Topics in Advanced Calculus and Linear Algebra

Matrices, introduction to linear algebra and vector analysis, integral theorems of Gauss, Green and Stokes; applications.

Prerequisites: MTH 33 or equivalent and ENG 02 and RDL 02 if required.

MTH 42 **4 rec 4 cr**

Linear Algebra

Vector spaces, basis and dimension, matrices, linear transformations, determinants, solution of systems of linear equations, eigenvalues and eigenvectors.

Prerequisites: MTH 32 or equivalent and ENG 02 and RDL 02 if required.

MTH 44 **4 rec 4 cr**

Vector Analysis

Differential geometry of curves, line integrals, surface integrals, change of variables, Green's theorem, Stokes' theorem, Gauss's Theorem.

Prerequisites: MTH 33 or equivalent and ENG 02 and RDL 02 if required.

MTH 46 **4 rec 4 cr**

Abstract Algebra

Properties of integers, permutations, groups, alternating groups, groups of symmetries, quotient groups, sets, mappings, isomorphisms, homomorphisms, rings, fields, polynomials.

Prerequisites: MTH 42 or equivalent and ENG 02 and RDL 02 if required.

MTH 48 **4 rec 4 cr**

Advanced Calculus

Advanced treatment of the real number system, properties of continuous functions, derivatives and differentials, rigorous work with limits, the definite integral, uniform continuity, uniform convergence, infinite sequences, functions defined by series.

Prerequisites: MTH 33 or equivalent and ENG 02 and RDL 02 if required.