

## FAQ: Placement Tests in Mathematics and Calculus

1. **At what level does an entering student begin mathematics at the University of Chicago?** This question is answered individually for students on the basis of their performance on one of two placement tests in mathematics administered during Orientation in September: either the Mathematics Placement Test or the Calculus Placement Test. Scores on either placement test may determine the appropriate beginning mathematics course for each student: a precalculus course (MATH 10500) or one of three other courses (MATH 11200, MATH 13100, or MATH 15100). Students who wish to begin at a level higher than MATH 15100 *must* take the *Calculus* Placement Test, unless they receive Advanced Placement credit as described in the following paragraphs.
2. **How do I know which test to take?** If you have had any calculus courses in high school, you should take the Calculus Placement Test. If you have never seen any calculus, you should take the Mathematics Placement Test.
3. **How important are these tests, really?** In addition to determining a student's placement in mathematics courses, these tests are used by the Departments of Chemistry and Physics to determine the appropriate placement for students in their courses.
4. **What's on the tests?** The Mathematics Placement Test covers the essential topics of precalculus, and the Calculus Placement Test covers the essential topics of single variable calculus (see lists at end).
5. **Are they multiple-choice tests?** The Mathematics Placement Test is entirely multiple-choice. The Calculus Placement Test has multiple-choice questions on precalculus and calculus topics, and also has some free-response questions.
6. **Do I need a calculator?** No calculators are permitted for either test.
7. **Can I fail this test?** No one fails the test, although the results may require students to begin mathematics or science courses at a particular level. For example, students who do not perform adequately on the Mathematics Placement Test will be required to complete the precalculus sequence MATH 10500-10600 before enrolling in any Mathematics or Physical Sciences courses.
8. **How does AP credit work?** Students who submit a score of 5 on the AB Advanced Placement test in Calculus or a score of 4 on the BC Advanced Placement test in Calculus receive credit for MATH 15100. Students who submit a score of 5 on the BC Advanced Placement test in Calculus receive credit for MATH 15100 and 15200. Currently no course credit is offered in the Mathematics Department at Chicago for work done in an International Baccalaureate Program or for British A-level or for O-level examinations. Therefore such students need to prepare especially well for these placement tests.
9. **What about my work in differential equations, or in multivariable calculus, or in linear algebra?** Since these topics are not covered on our placement tests, you will not receive any credit for these kinds of courses. You may petition for transfer credit once you enroll in the College, but most of these kinds of courses are not equivalent to any courses offered by the Department of Mathematics at the University of Chicago, and such transfer credit is rarely awarded. Such courses do provide students with strong computational background that aids in success in Chicago's mathematics courses.
10. **How do I decide what course to take, once I have these placement test results?** There are several opportunities during Orientation Week for students to discuss options available in mathematics and science courses. Students should look for Orientation Events regarding mathematics placement results, and should consult one of the Departmental Counselors if they

have any questions about mathematics courses, placement, transfer credit, etc. Math Departmental Counselors are John Boller ([oller@math.uchicago.edu](mailto:oller@math.uchicago.edu)) and Diane Herrmann ([diane@math.uchicago.edu](mailto:diane@math.uchicago.edu)).

11. **How do I qualify for Honors Calculus?** Students with suitable achievement on the calculus placement test are invited to begin with Honors Calculus (MATH 16100) or beyond. Excellent scores on the calculus placement test may give placement credit for one, two, or three quarters of calculus. The strong recommendation from the department is that students who have AP credit for one or two quarters of calculus enroll in Honors Calculus (MATH 16100) when they enter as first year students. This course builds on the strong computational background provided in AP courses and best prepares entering students for further study in mathematics.
12. **Are you saying that I should “give up” my AP credit and take this honors course?** Decisions about using AP credit or taking honors level courses are significant for entering students. If you find yourself asking this question after you receive your placement results, please either attend the appropriate Orientation session or consult with one of the Departmental Counselors, or do both.
13. **Is there any way to place out of a full year of calculus?** The only students who place out of a year of calculus do so by outstanding performance on our calculus placement test, especially on the free response section of the test. We evaluate each student’s familiarity with proof technique in analysis, and if that is sufficient, we recommend either that they begin in Math 19900, Introduction to Analysis and Linear Algebra, or Math 20700, Honors Analysis.
14. **How do I get into Honors Analysis?** Admission to Honors Analysis (MATH 20700) is by invitation only to those first-year students who show an exceptional performance on the calculus placement test or to those sophomores who receive a strong recommendation from their instructor in MATH 16100-16200-16300. If your initial placement is not into Honors Analysis and you want to have the option of taking it in the future, you should have a conversation with one of the Departmental Counselors.
15. **What precalculus topics are included?** The Mathematics Test consists entirely of precalculus topics, and the Calculus test also includes precalculus questions. Here are the topics included: sets and operations on sets; arithmetic of natural, integral, rational, and real numbers; elements of plane geometry; algebraic operations such as powers, roots, and absolute value; manipulation of polynomials, rational, and algebraic expressions; linear equations and inequalities; quadratic equations and inequalities; induction; progressions; binomial theorem; functions and their graphs; properties of special functions, including exponential, logarithmic, and trigonometric; elements of trigonometry; elements of analytic geometry, including of lines, circles and conics.
16. **What’s on the calculus test?** Topics include: concept of limit and first theorems about limits, infinite limits and asymptotes; continuity and elementary properties of continuous functions; concepts of derivative and differentiation, higher derivatives, geometric applications of integration, fundamental theorem of calculus; calculus of special functions (exponential and circular, and their inverses); special techniques of integration (by substitution, by parts, by partial fractions); area and arc length; sequences and series; Taylor’s series and the development of elementary functions. You are expected to be able to define fundamental concepts of calculus, to derive simple instances and consequences of their definitions, and to employ standard theorems of calculus in arguments and calculations.