CLEP Aligned Pre-Calculus

Prerequisite: Algebra II (recommended with at least a yearly average 80% and at least a 19 on the ACT)

CLEP Aligned Pre-Calculus combines the curriculum of the Tennessee State Standards for high school pre-calculus with the curriculum for both the College Algebra and College Pre-Calculus CLEP exams. Students will actually prepare for and be encouraged to take two different CLEP exams, one for College Algebra and one for College Pre-Calculus. If students pass both of these CLEP exams they could earn up to 7 college credit ours at most participating colleges and universities.

We will spend the entire first semester along with the month of January covering the material for the College Algebra CLEP test. We will be completing the Modern States online prep course and taking a "practice" College Algebra CLEP test during class at the end of January. We will then spend the remainder of the school year covering the material for the College Pre-Calculus CLEP test (including trigonometry and conic sections). We will be completing the Modern States prep course and taking a "practice" College Pre-calculus CLEP test in early May.

The cost for each of these CLEP exams is $87.50. There is also a test administration fee of approximately $25.00 for each CLEP test. However, if students complete the Modern States online Prep course, they can request a voucher which will cover the cost of the test and Modern States will even reimburse students for the test administration fee. That means students could earn up to 7 college credit hours for this course for free.

Below, you will find information concerning what material will be covered in the course along with what material will be tested on each of the CLEP exams.

Description of the CLEP College Algebra Examination

The College Algebra examination covers material that is usually taught in a one-semester college course in algebra. Nearly half of the test is made up of routine problems requiring basic algebraic s kills; the remainder involves solving nonroutine problems in which candidates must demonstrate their understanding of concepts. The test includes questions on basic algebraic operations; linear and quadratic equations, inequalities, and graphs; algebraic, exponential and logarithmic functions; and miscellaneous other topics. It is assumed that candidates are familiar with currently taught algebraic vocabulary, symbols and notation. The test places little emphasis on arithmetic calculations. However, an online scientific calculator (non-graphing) will be available during the examination.

The examination contains approximately 60 questions to be answered in 90 minutes. Some of these are pretest questions that will not be scored.

Knowledge and Skills Required

Questions on the College Algebra examination require candidates to demonstrate the following abilities in the approximate proportions indicated.

• Solving routine, straight forward problems (about 50 percent of the examination)

• Solving nonroutine problems requiring an understanding of concepts and the application of skills and concepts (about 50 percent of the examination)

The subject matter of the College Algebra examination is drawn from the following topics. The percentages next to the main topics indicate the approximate percentage of exam questions on that topic.

25% Algebraic Operations

Factoring and expanding polynomials, Operations with algebraic expressions, Operations with exponents, Properties of logarithms

25% Equations and Inequalities

Linear equations and inequalities, Quadratic equations and inequalities, Absolute value equations and inequalities, Systems of equations and inequalities, Exponential and logarithmic equations

30% Functions and Their Properties*

Definition and interpretation, Representation/modeling (graphical, numerical, symbolic and verbal representations of functions), Domain and range, Algebra of functions, Graphs and their properties (including intercepts, symmetry and transformations), Inverse functions

20% Number Systems and Operations

Real numbers, Complex numbers, Sequences and series, Factorials and Binomial Theorem, Determinants of 2-by-2matrices

*Each test may contain a variety of functions, including linear, polynomial (degree ≤5), rational, absolute value, power,
exponential, logarithmic and piecewise defined.

Description of the CLEP Pre-Calculus Examination

The Precalculus examination assesses student mastery of skills and concepts required for success in a first-semester calculus course. A large portion of the exam is devoted to testing a student’s understanding of functions and their properties. Many of the questions test a student’s knowledge of specific properties of the following types of functions: linear, quadratic, absolute value, square root, polynomial, rational, exponential, logarithmic, trigonometric, inverse trigonometric and piecewise-defined. Questions on the exam will present these types of functions symbolically, graphically, verbally or in tabular form. A solid understanding of these types of functions is at the core of all precalculus courses, and it is a prerequisite for enrolling in calculus and other college-level mathematics courses.

The examination contains approximately 48 questions, in two sections, to be answered in 90 minutes. Any time candidates spend on tutorials and providing personal information is in addition to the actual testing time.

- Section 1: 25 questions, 50 minutes.
  The use of an online graphing calculator (non-CAS) is allowed for this section. Only some of the questions will require the use of the calculator.
- Section 2: 23 questions, 40 minutes.
  No calculator is allowed for this section.

  Although most of the questions on the exam are multiple-choice, there are some questions that require students to enter a numerical answer.

Graphing Calculator

A graphing calculator, which is integrated into the exam software, is available to students only during Section 1 of the exam. Students are expected to know how and when to make use of it. The graphing calculator, together with a brief tutorial, is available to students as a free download for a 90-day trial period. Students are expected to become familiar with its functionality prior to taking the exam.

In order to answer some of the questions in Section 1 of the exam, students may be required to use the online graphing calculator in the following ways:

• Perform calculations (e.g., exponents, roots, trigonometric values, logarithms).

• Graph functions and analyze the graphs.

• Find zeros of functions.

• Find points of intersection of graphs of functions.

• Find minima/maxima of functions.

• Find numerical solutions to equations.

• Generate a table of values for a function.

Knowledge and Skills Required

Questions on the examination require candidates to demonstrate the following abilities.

- Recalling factual knowledge and/or performing routine mathematical manipulation.
- Solving problems that demonstrate comprehension of mathematical ideas and/or concepts.
- Solving nonroutine problems or problems that require insight, ingenuity or higher mental processes.

The subject matter of the Precalculus examination is drawn from the following topics. The percentages next to the topics indicate the approximate percentage of exam questions on that topic.

20% Algebraic Expressions, Equations and Inequalities

Ability to perform operations on algebraic expressions, Ability to solve equations and inequalities, including linear, quadratic, absolute value, polynomial, rational, radical, exponential, logarithmic and trigonometric, Ability to solve systems of equations, including linear and nonlinear

15% Functions: Concept, Properties and Operations

Ability to demonstrate an understanding of the concept of a function, the general properties of functions (e.g., domain, range), function notation, and to perform symbolic operations with functions (e.g., evaluation, inverse functions)

30% Representations of Functions: Symbolic, Graphical and Tabular

Ability to recognize and perform operations and transformations on functions presented symbolically, graphically or in tabular form, Ability to demonstrate an understanding of basic properties of functions and to recognize elementary functions (linear, quadratic, absolute value, square root, polynomial, rational, exponential, logarithmic, trigonometric, inverse trigonometric and piecewise-defined functions) that are presented symbolically, graphically or in tabular form

10% Analytic Geometry

Ability to demonstrate an understanding of the analytic geometry of lines, circles, parabolas, ellipses and hyperbolas

15% Trigonometry and its Applications*

Ability to demonstrate an understanding of the basic trigonometric functions and their inverses and to apply the basic trigonometric ratios and identities (in right triangles and on the unit circle), Ability to apply trigonometry in various problem-solving contexts

10% Functions as Models

Ability to interpret and construct functions as models and to translate ideas among symbolic, graphical, tabular and verbal representations of functions

*Note that trigonometry permeates most of the major topics and accounts for more than 15 percent of the exam. The actual proportion of exam questions that requires knowledge of either right triangle trigonometry or the properties of the trigonometric functions is approximately 30–40 percent.

History of CLEP

Since 1967, the College-Level Examination Program (CLEP®) has provided over six million people with the opportunity to reach their educational goals. CLEP participants have received college credit for knowledge and expertise they have gained through prior course work, independent study or work and life experience.

Over the years, the CLEP examinations have evolved to keep pace with changing curricula and pedagogy. Typically, the examinations represent material taught in introductory college-level courses from all areas of the college curriculum. Students may choose from 33 different subject areas in which to demonstrate their mastery of college-level material.

Today, more than 2,900 colleges and universities recognize and grant credit for CLEP.

Philosophy of CLEP

Promoting access to higher education is CLEP's foundation. CLEP offers students an opportunity to demonstrate and receive validation of their college-level skills and knowledge. Students who achieve an appropriate score on a CLEP exam can enrich their college experience with higher-level courses in their major field of study, expand their horizons by taking a wider array of electives and avoid repetition of material that they already know.