CLEP® College Mathematics: At a Glance

Description of the Examination

The CLEP® College Mathematics examination covers material generally taught in a college course for nonmathematics majors and majors in fields not requiring knowledge of advanced mathematics. The examination contains approximately 60 questions to be answered in 90 minutes. Some of these are pretest questions that will not be scored.

The examination places little emphasis on arithmetic calculations, and it does not contain any questions that require the use of a calculator. However, an online scientific calculator (nongraphing) is available to candidates during the examination as part of the testing software. It is assumed that candidates are familiar with currently taught mathematics vocabulary, symbols and notation.

Knowledge and Skills Required

Questions on the College Mathematics examination require candidates to demonstrate the following abilities in the approximate proportions indicated:

• Solving routine, straightforward 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 Mathematics examination is drawn from the following topics. The percentages next to the main topics indicate the approximate percentage of exam questions on that topic.

10% Sets
Union and intersection

Subsets, disjoint sets, equivalent sets

Venn diagrams

Cartesian product

10% Logic
Truth tables

Conjunctions, disjunctions, implications and negations

Conditional statements

Necessary and sufficient conditions

Converse, inverse and contrapositive

Hypotheses, conclusions and counterexamples

20% Real Number System
Prime and composite numbers

Odd and even numbers

Factors and divisibility

Rational and irrational numbers

Absolute value and order

Open and closed intervals

20% Functions and Their Graphs
Properties and graphs of functions

Domain and range

Composition of functions and inverse functions

Simple transformations of functions: translations, reflections, symmetry

25% Probability and Statistics
Counting problems, including permutations and combinations

Computation of probabilities of simple and compound events

Simple conditional probability

Mean, median, mode and range

Concept of standard deviation

Data interpretation and representation: tables, bar graphs, line graphs, circle graphs, pie charts, scatterplots, histograms

15% Additional Topics from Algebra and Geometry
Complex numbers

Logarithms and exponents

Applications from algebra and geometry

Perimeter and area of plane figures

Properties of triangles, circles and rectangles

The Pythagorean theorem

Parallel and perpendicular lines

Algebraic equations, systems of linear equations and inequalities

Fundamental Theorem of Algebra, Remainder Theorem, Factor Theorem

Study Resources

Most textbooks used in college-level mathematics courses cover the topics in the outline above, but the approaches to certain topics and the emphases given to them may differ. To prepare for the College Mathematics exam, it is advisable to study one or more introductory college-level mathematics textbooks,

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which can be found in most college bookstores. Elementary algebra textbooks also cover many of the topics on the College Mathematics exam. When selecting a textbook, check the table of contents against the Knowledge and Skills Required for this test.

Visit **www.collegeboard.com/clepprep** for additional mathematics resources. You can also find suggestions for exam preparation in Chapter IV of the *CLEP Official Study Guide*. In addition, many college faculty post their course materials on their schools' websites.

Sample Test Questions

The following sample questions do not appear on an actual CLEP examination. They are intended to give potential test-takers an indication of the format and difficulty level of the examination and to provide content for practice and review. For more sample questions and information about the test, see the *CLEP Official Study Guide*.

1. In a group of 200 high school students, 36 are taking biology, 52 are taking Spanish, and 126 are taking neither biology nor Spanish. If one of these 200 students is to be chosen at random, what is the probability that the student chosen is taking biology but not Spanish?

(A)   7%

(B)   11%

(C)   18%

(D)   37%

2. In a set of four index cards, each card has a letter written on one side and a number written on the other side.

| If a card has an S on one side, it has a 6 on the other side. |
| --- |

One side of each of the four cards is shown in the table below. Which of the cards must be turned over to check the truth of the boxed statement above? Click the appropriate box(es) to indicate your choices.

Card	Must Be Turned Over
3	
6	
S	
Y	

3. n is an integer. For each of the following numbers, indicate whether the number must be divisible by 3, may or may not be divisible by 3, or cannot be divisible by 3.

Click the appropriate box(es) to indicate your choices.

Number	Must Be Divisible by 3	May or May Not Be Divisible by 3	Cannot Be Divisible by 3
$n(n + 1)(n + 2)$			
$n(n + 2)(n + 4)$			
$n(n + 3)(n + 6)$			
$(3n + 1)(3n + 2)$			
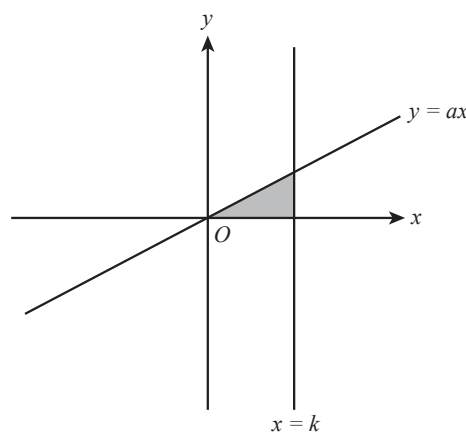
4. The shaded triangle in the xy-plane above is formed by the x-axis, the line $y = ax$, and the line $x = k$. The intersection of which of the following sets of lines produces a triangle similar to the shaded triangle?

(A) $y = 2ax, \ x = 2k, \ $ and the x-axis

(B) $y = 2ax, \ x = k, \ $ and the x-axis

(C) $y = ax, \ x = 2k, \ $ and the x-axis

(D) $y = \dfrac{a}{2}x, \ x = 2k, \ $ and the x-axis

5. For how many of the integers from 10 to 99, inclusive, is the tens digit larger than the ones digit? (Type your answer in the box below.)

[ ]

6. Which of the following must be true about the mean and median of 101 consecutive integers?

(A)   The mean is less than the median.

(B)   The mean is greater than the median.

(C)   The mean is equal to the median.

(D)   There is not enough information to determine the relationship between the mean and the median.

7. The quadratic equation $x^2 + mx + q = 0$, where m and q are real numbers, has the complex root $a + bi$. Which of the following must be equal to m?

(A) $2a$

(B) $-2a$

(C) $2b$

(D) $-2b$

Credit Recommendations

The American Council on Education has recommended that colleges grant 6 credits for a score of 50, which is equivalent to a course grade of C, on the CLEP College Mathematics exam. Each college, however, is responsible for setting its own policy. For candidates with satisfactory scores on the CLEP College Mathematics examination, colleges may grant credit toward fulfillment of a distribution requirement, or for a particular course that matches the exam in content. Check with your school to find out the score it requires for granting credit, the number of credit hours granted and the course that can be bypassed with a passing score.

Answers to Sample Questions:
(1) B; (2) see below; (3) see below; (4) C; (5) 45; (6) C; (7) B.

2.

Card	Must Be Turned Over
3	×
6	
S	×
Y	

3.

Number	Must Be Divisible by 3	May or May Not Be Divisible by 3	Cannot Be Divisible by 3
$n(n + 1)(n + 2)$	×		
$n(n + 2)(n + 4)$	×		
$n(n + 3)(n + 6)$		×	
$(3n + 1)(3n + 2)$			×

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