

Transition to College Mathematics

Mathematics Curriculum Framework

Revised 2004

Course Title: Transition Mathematics (Fourth-year Course)
 Course/Unit Credit: 1
 Course Number:
 Teacher Licensure: Secondary Mathematics/Workshop Required
 Pre-requisite: Algebra II
 Grades: 9-12

Transition to College Mathematics

Transition to College Mathematics is intended to build on previous courses in Algebra I, Geometry, and Algebra II (or their equivalents in multi-year integrated programs) and to place emphasis on bringing about a deeper understanding of those mathematical relationships. This course may be completed to satisfy the fourth year of mathematics required for unconditional admission to Arkansas' colleges and universities.

It is recommended that emphasis throughout the course be placed on numerical and graphical representations, modeling from data, reasoning clearly and communicating concepts via writing, speaking, listening, drawing, reading, and integrating technology as a tool for developing a deeper understanding of mathematical structure. Students are expected to use technology, including graphing calculators, computers, and data-gathering equipment throughout the course. Graphing calculators should be an integral part of all instruction. The statistics strand is incorporated throughout as students create models for a set of data, write an equation for the model, and use it to make predictions or estimates. Ongoing emphasis should be placed on helping students develop study skills and time management that are critical for success in college. The curriculum delivery focus is on student learning. The context in which the mathematical content is developed should be carefully chosen to appeal to students without diminishing the importance and depth of the mathematics.

In addition to lesson quizzes and unit exams, student assessment should include alternative forms of assessment such as oral and written presentations, constructed response items with scoring rubrics, extended projects, and/or student journals and portfolios.

Strand	Standard
Linear Functions	
	1. Students will extend their knowledge of linear equations by using <i>student-generated data</i> to represent constant rates of change. Appropriate technology is essential.
Exponential Functions	
	2. Students will enhance their knowledge of exponential functions by exploring the nature of multiplicative change.
Mathematical Models	
	3. Students will expand their use of mathematical models to describe <i>continuous, discontinuous, and discrete</i> phenomena.
Probability and Statistics	
	4. Students will develop strategies that will enable them to make decisions based upon appropriate analysis of data.

Linear Functions

Content Standard 1. Students will extend their knowledge of linear equations by using *student-generated data* to represent constant rates of change. Appropriate technology is essential.

LF.1.TM.1	Identify a linear relationship represented by a table, by a graph, and by symbolic forms
LF.1.TM.2	Determine the initial condition and the rate of change in real-world situations described by $y = mx + b$
LF.1.TM.3	Make inferences and predictions using <ul style="list-style-type: none">• <i>recursion</i> on the table• inspection on the graph• algebraic manipulation on the model
LF.1.TM.4	Explain, conjecture, summarize, and defend results orally, in writing and through the use of appropriate technology

Exponential Functions

Content Standard 2. Students will enhance their knowledge of exponential functions by exploring the nature of multiplicative change.

EF.2.TM.1	Identify <i>exponential growth</i> or <i>decay</i> by creating tables, graphs, and mathematical models
EF.2.TM.2	Compare <i>exponential models</i>
EF.2.TM.3	Compare and contrast linear and exponential models
EF.2.TM.4	Make inferences and predictions using <ul style="list-style-type: none">• recursion on the table• inspection of the graph• algebraic manipulation on the model
EF.2.TM.5	Develop, with appropriate technology, an algebraic model through the <i>regression</i> process
EF.2.TM.6	Explain, conjecture, summarize, and defend results orally, in writing, and through the use of appropriate technology

Mathematical Models

Content Standard 3. Students will expand their use of mathematical models to describe *continuous*, *discontinuous*, and *discrete* phenomena.

MM.3.TM.1	Establish connections between tables and graphs and the symbolic form using geometric and algebraic models (quadratic, rational, etc.)
MM.3.TM.2	Apply, with appropriate technology, matrices to real world problems and decision making
MM.3.TM.3	Make inferences and predictions using <ul style="list-style-type: none">• recursion on the table• inspection of the graph• algebraic manipulation on the model
MM.3.TM.4	Explain, conjecture, summarize, and defend results orally, in writing, and through the use of appropriate technology

Probability and Statistics

Content Standard 4. Students will develop strategies that will enable them to make decisions based upon appropriate analysis of data.

PS.4.TM.1	Formulate questions that can be addressed with data and, with appropriate technology, collect, organize, and display relevant data to answer the questions
PS.4.TM.2	Describe and summarize data numerically using <i>central tendency variation, position statistics, and distributions</i>
PS.4.TM.3	Use <i>counting methods, permutations, and combinations</i> to evaluate the likelihood of events occurring
PS.4.TM.4	Make inferences and predictions using <ul style="list-style-type: none">• recursion on the table• inspection of the graph• algebraic manipulation on the model
PS.4.TM.5	Explain, conjecture, summarize, and defend results orally, in writing, and through the use of appropriate technology

Transitions to College Mathematics Glossary

Central Tendency	A single number that is used to describe a set of numbers (mean, median, mode, etc.)
Combination	Subsets chosen from a larger set of objects in which the order of the items does not matter
Continuous	A graph of a function that can be traced with a pencil that never leaves the paper
Counting Methods	Methods of finding total number of occurrences of an event
Discontinuous	A function that is not continuous
Discrete	Disconnected data points
Distribution	A term used to describe the relative arrangement of data
Exponential Decay	Exponential decay occurs when a quantity decreases exponentially.
Exponential Growth	Exponential growth occurs when a quantity increases exponentially.
Exponential Model	An activity that leads a student to develop the equation $y = ab^x$
Permutations	An arrangement of a given number of objects from a given set in which the order of the objects is significant
Position Statistics	An analysis of the relative location of a data point when compared to the set of data points
Recursion	When consecutive terms are defined in terms of the previous term
Student-generated data	Data collected by the students from an experiment, survey, etc.
Variation	A term used to describe how the data differs from the norm