

M CC117
College Algebra in Context I
Course Objectives

Unit 1: Linear Functions

- 1.1 Generalize linear equations from tables and graphs
 - 1.1.1 Given a verbal description, write a linear equation.
 - 1.1.2 Given a table write a linear equation.
 - 1.1.3 Given a graph write a linear equation.
- 1.2 Use function notation
 - 1.2.1 Define and identify functions.
 - 1.2.2 Evaluate and graph functions.
 - 1.2.3 Interpret functions from their graphs.
- 1.3 Determine the equation of the line given conditions
 - 1.3.1 Use slope-intercept to determine the equation of the line.
 - 1.3.2 Use point-slope to determine the equation of the line.
 - 1.3.3 Find equations of parallel and perpendicular lines.
- 1.4 Solving equations and inequalities
 - 1.4.1 Solve linear equations.
 - 1.4.2 Solve linear inequalities.
 - 1.4.3 Solve literal equations.
- 1.5 Model with linear functions
 - 1.5.1 Determine if a data set is linear.
 - 1.5.2 Given a data set determine a trend line and make predictions.

Unit 2: Absolute Value and Piecewise-Defined Functions

- 2.1 Graph absolute functions
 - 2.1.1 Given an absolute value function, sketch its graph.
 - 2.1.2 Given the graph of an absolute value function, determine its equation.
- 2.2 Graph piecewise-defined functions
 - 2.2.1 Graph and interpret piecewise-defined functions.
 - 2.2.2 Given a piecewise-defined function determine the rules and domains.
- 2.3 Solve absolute value equations
 - 2.3.1 Develop and apply methods to solve absolute value equations of the form $|u| = a$ where $a > 0$.
 - 2.3.2 Develop and apply methods to solve absolute value equations of the form $|u| = v$, where v is an expression in x .
- 2.4 Solve absolute value inequalities
 - 2.4.1 Develop and apply methods to solve absolute value inequalities of the form $|u| < a$, where $a > 0$.
 - 2.4.2 Develop and apply methods to solve absolute value inequalities of the form $|u| > a$, where $a > 0$.
- 2.5 Model with absolute value and piecewise-defined functions

- 2.5.1 Model and interpret situations with absolute value functions.
- 2.5.2 Model and interpret situations with piecewise-defined functions.

Unit 3: Quadratic Relations and Functions

3.1 Graph quadratic functions

- 3.1.1 Given the graph of a quadratic function, determine its equation.
- 3.1.2 Write a quadratic function in vertex form and sketch a graph.
- 3.1.3 Solve quadratic maximum/minimum applications.

3.2 Solve quadratic equations

- 3.2.1 Solve quadratic equations by factoring and using technology.
- 3.2.2 Solve quadratic equations by completing the square and with the quadratic formula.

3.3 Solve quadratic inequalities

- 3.3.1 Develop and apply methods to solve quadratic inequalities.
- 3.3.2 Solve quadratic inequality applications.

3.4 Graph circles and ellipses

- 3.4.1 Determine the distance between two points.
- 3.4.2 Graph and interpret graphs of the form $(x-h)^2 + (y-k)^2 = r^2$.
- 3.4.3 Graph and interpret graphs of the form $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$.

3.5 Model with quadratic functions and relations

- 3.5.1 Solve applications.
- 3.5.2 Model and interpret situations with quadratic functions.

Unit 4: Systems of Equations and Inequalities

4.1 Solve systems of linear equations

- 4.1.1 Solve systems using substitution.
- 4.1.2 Solve systems using elimination.

4.2 Solve systems using matrices

- 4.2.1 Solve two variable systems using row reduction.
- 4.2.2 Solve multi-variable systems using matrices.

4.3 Solve systems of linear inequalities

- 4.3.1 Solve linear inequalities.
- 4.3.2 Solve systems of linear inequalities.

4.4 Solve systems with other functions and relations

- 4.4.1 Solve nonlinear systems of equations.
- 4.4.2 Solve nonlinear systems of inequalities.

4.5 Model with systems.

- 4.5.1 Model with systems I.
- 4.5.2 Model with systems II.