ALEKS®

Class Syllabus

Class: MAC 1105 H1 Summer 2023 - 30215 **Class Code:** QLFFF-TUXFV

Subject: College Algebra **Instructor:** Prof. Flores

Class Dates: 05/08/2023 - 06/19/2023 **Class Content:** 185 topics / 176 accessible topics

Textbook: Miller/Gerken: College Algebra, 3rd Ed. (McGraw Hill)

Modules	Dates
1. Functions and Graphs (30 topics)	05/11/2023 12:00 AM - 05/13/2023 11:59 PM
2. Linear Functions, Slope, and Applications (23 topics)	05/14/2023 12:00 AM - 05/16/2023 11:59 PM
3. More on Functions (17 topics)	05/17/2023 12:00 AM - 05/19/2023 11:59 PM
4. Composite and Inverse Functions (11 topics)	05/20/2023 12:00 AM - 05/22/2023 11:59 PM
5. Symmetry and Transformations (18 topics)	05/23/2023 12:00 AM - 05/25/2023 11:59 PM
6. Variations and Applications (9 topics)	05/26/2023 12:00 AM - 05/28/2023 11:59 PM
7. Distance, Midpoints, and Circles (12 topics)	05/29/2023 12:00 AM - 05/31/2023 11:59 PM
8. Zeros of Linear Functions and Models (18 topics)	06/01/2023 12:00 AM - 06/03/2023 11:59 PM
9. Polynomial Functions (8 topics)	06/04/2023 12:00 AM - 06/06/2023 11:59 PM
10. The Complex Numbers (6 topics)	06/07/2023 12:00 AM - 06/09/2023 11:59 PM
11. Zeros of Quadratic Functions (15 topics)	06/10/2023 12:00 AM - 06/12/2023 11:59 PM
12. Analyzing Graphs of Quadratic Functions (11 topics)	06/13/2023 12:00 AM - 06/15/2023 11:59 PM
13. Zeros and More Equation Solving (15 topics)	06/16/2023 12:00 AM - 06/18/2023 11:59 PM

Ⓐ Accessible Topic - Topics accessible to visually impaired students using a screen reader.

Functions and Graphs (30 Topics, due on 05/13/2023 11:59 PM) Estimated Time: 3h 02m

Section R.3 (1 Topic)

- Simplifying the square root of a whole number less than 100 (4m) Ⓐ

Section 1.6 (1 Topic)

- Introduction to solving a radical equation (2m) Ⓐ

Section 2.3 (24 Topics)

- Finding x- and y-intercepts given the graph of a line on a grid (3m) Ⓐ
- Identifying functions from relations (4m) Ⓐ
- Vertical line test (3m) Ⓐ
- Table for a linear function (9m) Ⓐ
- Evaluating functions: Linear and quadratic or cubic (8m) Ⓐ
- Evaluating a rational function: Problem type 1 (5m) Ⓐ
- Evaluating a rational function: Problem type 2 (8m) Ⓐ
- Table for a square root function (7m) Ⓐ
- Variable expressions as inputs of functions: Problem type 1 (6m) Ⓐ
- Variable expressions as inputs of functions: Problem type 2 (10m) Ⓐ
- Domain and range from ordered pairs (4m) Ⓐ
- Domain of a rational function: Excluded values (4m) Ⓐ
- Domain of a rational function: Interval notation (11m) Ⓐ
- Domain of a square root function: Basic (4m) Ⓐ
- Domain of a square root function: Advanced (5m) Ⓐ
- Finding the domain of a fractional function involving radicals (6m) Ⓐ
- Determining whether an equation defines a function: Basic (5m) Ⓐ
- Finding outputs of a two-step function with decimals that models a real-world situation: Function notation (5m) Ⓐ
- Finding inputs and outputs of a two-step function that models a real-world situation: Function notation (11m) Ⓐ
- Finding an output of a function from its graph (2m) Ⓐ
- Finding inputs and outputs of a function from its graph (5m) Ⓐ

- Domain and range from the graph of a continuous function (6m)
- Domain and range from the graph of a piecewise function (7m)
- Domain and range from the graph of a quadratic function (5m)

Section 2.4 (4 Topics)

- Table for a linear equation (9m)
- Identifying solutions to a linear equation in two variables (8m)
- Graphing a line given its equation in slope-intercept form: Integer slope (9m)
- Graphing a line given its equation in slope-intercept form: Fractional slope (7m)

Section 3.1 (1 Topic*)

- Domain and range from the graph of a quadratic function (5m)

(*) Some topics in this section are also covered in a previous section of this Module. Topics are only counted once towards the total number of topics for this Module.

Linear Functions, Slope, and Applications (23 Topics, due on 05/16/2023 11:59 PM) Estimated Time: 2h 27m

Section 1.2 (1 Topic)

- Solving a decimal word problem using a linear equation of the form Ax + B = C (8m)

Section 2.4 (17 Topics)

- Graphing a line given its equation in standard form (6m)
- Graphing a vertical or horizontal line (2m)
- Finding x- and y-intercepts of a line given the equation: Basic (5m)
- Classifying slopes given graphs of lines (2m)
- Finding slope given the graph of a line on a grid (6m)
- Finding slope given two points on a line (5m)
- Finding the slopes of horizontal and vertical lines (5m)
- Graphing a line given its slope and y-intercept (5m)
- Finding the slope and y-intercept of a line given its equation in the form y = mx + b (4m)
- Finding the slope and y-intercept of a line given its equation in the form Ax + By = C (5m)
- Graphing a line by first finding its slope and y-intercept (6m)
- Writing an equation of a line given its slope and y-intercept (3m)
- Writing an equation in slope-intercept form given the slope and a point (6m)
- Writing the equation of a line through two given points (12m)
- Writing the equations of vertical and horizontal lines through a given point (3m)
- Finding the initial amount and rate of change given a graph of a linear function (5m)
- Word problem involving average rate of change (10m)

Section 2.5 (8 Topics*)

- Graphing a vertical or horizontal line (2m)
- Rewriting a linear equation in the form Ax + By = C (6m)
- Writing the equation of a line through two given points (12m)
- Writing the equations of vertical and horizontal lines through a given point (3m)
- Writing and evaluating a function that models a real-world situation: Advanced (6m)
- Writing an equation and drawing its graph to model a real-world situation: Advanced (14m)
- Interpreting the parameters of a linear function that models a real-world situation (4m)
- Application problem with a linear function: Finding a coordinate given two points (19m)

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More on Functions (17 Topics, due on 05/19/2023 11:59 PM) Estimated Time: 2h 49m

Section 1.6 (1 Topic)

- Solving a radical equation that simplifies to a linear equation: One radical, basic (6m)

Section 2.3 (2 Topics)

- Finding an output of a function from its graph (2m)
- Finding inputs and outputs of a function from its graph (5m)

Section 2.7 (6 Topics)

- Finding where a function is increasing, decreasing, or constant given the graph (1m)
- Finding where a function is increasing, decreasing, or constant given the graph: Interval notation (4m)
- Finding local maxima and minima of a function given the graph (5m)
- Graphing a piecewise-defined function: Problem type 1 (11m)
- Graphing a piecewise-defined function: Problem type 2 (15m)
- Graphing a piecewise-defined function: Problem type 3 (20m)

Section 2.8 (7 Topics)

- Combining functions to write a new function that models a real-world situation (11m)
- Finding a difference quotient for a linear or quadratic function (13m)
- Finding a difference quotient for a rational function (14m)
- Sum, difference, and product of two functions (14m)
- Quotient of two functions: Basic (10m)
- Quotient of two functions: Advanced (14m)
- Combining functions: Advanced (16m)

Chapter 2 Supplementary Topics (1 Topic)

- Finding values and intervals where the graph of a function is zero, positive, or negative (8m)

Composite and Inverse Functions (11 Topics, due on 05/22/2023 11:59 PM) Estimated Time: 1h 37m

Section 2.6 (1 Topic)

- Translating the graph of a parabola: One step (5m)

Section 2.8 (7 Topics)

- Introduction to the composition of two functions (7m)
- Composition of two functions: Basic (11m)
- Composition of a function with itself (12m)
- Expressing a function as a composition of two functions (6m)
- Composition of two functions: Domain and range (12m)
- Composition of two functions: Advanced (13m)
- Word problem involving composition of two functions (6m)

Chapter 2 Supplementary Topics (1 Topic)

- Composition of two rational functions (15m)

Section 4.1 (2 Topics)

- Horizontal line test (3m)
- Graphing the inverse of a function given its graph (7m)

Symmetry and Transformations (18 Topics, due on 05/25/2023 11:59 PM) Estimated Time: 2h

Section 2.6 (12 Topics)

- Matching parent graphs with their equations (4m)
- Translating the graph of a parabola: Two steps (2m)
- Translating the graph of an absolute value function: One step (3m)
- Translating the graph of an absolute value function: Two steps (2m)
- How the leading coefficient affects the graph of an absolute value function (7m)
- Writing an equation for a function after a vertical translation (3m)
- Translating the graph of a function: One step (4m)
- Translating the graph of a function: Two steps (2m)
- Transforming the graph of a function by reflecting over an axis (10m)
- Transforming the graph of a function using more than one transformation (18m)
- Transforming the graph of a quadratic, cubic, square root, or absolute value function (8m)
- Writing an equation for a function after a vertical and horizontal translation (6m)

Section 2.7 (4 Topics)

- Determining if graphs have symmetry with respect to the x-axis, y-axis, or origin (5m)
- Testing an equation for symmetry about the axes and origin (7m)
- Even and odd functions: Problem type 1 (5m)

- Even and odd functions: Problem type 2 (6m)

Section 4.1 (2 Topics)

- Determining whether two functions are inverses of each other (13m)
- Inverse functions: Rational (15m)

Variations and Applications (9 Topics, due on 05/28/2023 11:59 PM) Estimated Time: 1h 10m

Section 3.8 (9 Topics)

- Identifying direct variation equations (6m)
- Identifying direct variation from ordered pairs and writing equations (7m)
- Writing a direct variation equation (7m)
- Word problem on direct variation (7m)
- Writing an inverse variation equation (5m)
- Identifying direct and inverse variation equations (9m)
- Identifying direct and inverse variation from ordered pairs and writing equations (9m)
- Writing an equation that models variation (5m)
- Word problem on combined variation (15m)

Distance, Midpoints, and Circles (12 Topics, due on 05/31/2023 11:59 PM) Estimated Time: 1h 30m

Section 1.4 (1 Topic)

- Completing the square (3m)

Section 2.1 (2 Topics)

- Distance between two points in the plane: Exact answers (7m)
- Midpoint of a line segment in the plane (5m)

Section 2.2 (6 Topics)

- Identifying the center and radius to graph a circle given its equation in standard form (6m)
- Identifying the center and radius to graph a circle given its equation in general form: Basic (10m)
- Identifying the center and radius to graph a circle given its equation in general form: Advanced (11m)
- Writing the equation of a circle centered at the origin given its radius or a point on the circle (4m)
- Writing an equation of a circle given its center and radius or diameter (6m)
- Writing an equation of a circle given the endpoints of a diameter (15m)

Chapter 2 Supplementary Topics (3 Topics)

- Distance between two points in the plane: Decimal answers (7m)
- Finding an endpoint of a line segment given the other endpoint and the midpoint (8m)
- Writing an equation of a circle and identifying points that lie on the circle (8m)

Zeros of Linear Functions and Models (18 Topics, due on 06/03/2023 11:59 PM) Estimated Time: 2h 53m

Section 1.2 (8 Topics)

- Writing a multi-step equation for a real-world situation (9m)
- Solving a value mixture problem using a linear equation (18m)
- Solving a distance, rate, time problem using a linear equation (11m)
- Finding a side length given the perimeter and side lengths with variables (7m)
- Finding the perimeter or area of a rectangle given one of these values (14m)
- Finding the sale price given the original price and percent discount (5m)
- Computing a percent mixture (10m)
- Solving a percent mixture problem using a linear equation (22m)

Chapter 1 Supplementary Topics (2 Topics)

- Finding the total cost including tax or markup (6m)
- Finding the original price given the sale price and percent discount (8m)

Section 2.3 (1 Topic)

- Finding x- and y-intercepts given the graph of a line on a grid (3m)

Section 2.4 (2 Topics)

- Finding x- and y-intercepts of a line given the equation: Basic (5m)
- Finding x- and y-intercepts of a line given the equation: Advanced (5m)

Section 2.5 (4 Topics)

- Writing an equation and drawing its graph to model a real-world situation: Advanced (14m)
- Interpreting the parameters of a linear function that models a real-world situation (4m)
- Application problem with a linear function: Finding a coordinate given two points (19m)
- Interpreting the graphs of two functions (7m)

Chapter 2 Supplementary Topics (1 Topic)

- Graphing a line by first finding its x- and y-intercepts (6m)

Polynomial Functions (8 Topics, due on 06/06/2023 11:59 PM) Estimated Time: 48m

Section 1.4 (1 Topic)

- Solving an equation of the form $x^2 = a$ using the square root property (2m)

Section 3.2 (7 Topics)

- Finding the zeros of a quadratic function given its equation (4m)
- Finding zeros of a polynomial function written in factored form (4m)
- Finding zeros and their multiplicities given a polynomial function written in factored form (4m)
- Finding x- and y-intercepts given a polynomial function (7m)
- Determining the end behavior of the graph of a polynomial function (9m)
- Matching graphs with polynomial functions (8m)
- Inferring properties of a polynomial function from its graph (10m)

The Complex Numbers (6 Topics, due on 06/09/2023 11:59 PM) Estimated Time: 34m

Section 1.3 (6 Topics)

- Using i to rewrite square roots of negative numbers (4m)
- Simplifying a product and quotient involving square roots of negative numbers (10m)
- Adding or subtracting complex numbers (3m)
- Multiplying complex numbers (5m)
- Dividing complex numbers (8m)
- Simplifying a power of i (4m)

Zeros of Quadratic Functions (15 Topics, due on 06/12/2023 11:59 PM) Estimated Time: 1h 42m

Section 1.4 (9 Topics)

- Finding the roots of a quadratic equation of the form $ax^2 + bx = 0$ (3m)
- Finding the roots of a quadratic equation with leading coefficient greater than 1 (8m)
- Solving a quadratic equation needing simplification (7m)
- Writing a quadratic equation given the roots and the leading coefficient (6m)
- Solving a quadratic equation using the square root property: Exact answers, basic (4m)
- Solving a quadratic equation by completing the square: Exact answers (10m)
- Applying the quadratic formula: Exact answers (9m)
- Solving a quadratic equation with complex roots (10m)
- Discriminant of a quadratic equation (6m)

Section 2.6 (1 Topic)

- Graphing a parabola of the form $y = (x-h)^2 + k$ (10m)

Section 3.1 (2 Topics*)

- Graphing a parabola of the form $y = (x-h)^2 + k$ (10m)
- Finding the x-intercept(s) and the vertex of a parabola (7m)

Section 3.3 (1 Topic)

- Writing a quadratic function given its zeros (3m)

Chapter 3 Supplementary Topics (3 Topics)

- Using a graphing calculator to find the zeros of a quadratic function (5m)

- Using a graphing calculator to find the x-intercept(s) and vertex of a quadratic function (8m)
- Rewriting a quadratic function in standard form (6m)

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Analyzing Graphs of Quadratic Functions (11 Topics, due on 06/15/2023 11:59 PM) Estimated Time: 1h 57m

Section 3.1 (10 Topics)

- Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola (5m)
- Graphing a parabola of the form $y = x^2 + bx + c$ (10m)
- Graphing a parabola of the form $y = a(x-h)^2 + k$ (10m)
- Graphing a parabola of the form $y = ax^2 + bx + c$: Integer coefficients (10m)
- Finding the x-intercept(s) and the vertex of a parabola (7m)
- Rewriting a quadratic function to find its vertex and sketch its graph (15m)
- Finding the maximum or minimum of a quadratic function (7m)
- Word problem involving the maximum or minimum of a quadratic function (12m)
- Word problem involving optimizing area by using a quadratic function (20m)
- Choosing a quadratic model and using it to make a prediction (6m)

Section 3.2 (1 Topic)

- Determining end behavior and intercepts to graph a polynomial function (15m)

Zeros and More Equation Solving (15 Topics, due on 06/18/2023 11:59 PM) Estimated Time: 1h 17m

Section 1.6 (14 Topics)

- Solving an absolute value equation: Problem type 2 (5m)
- Solving an absolute value equation: Problem type 3 (4m)
- Solving an absolute value equation: Problem type 4 (4m)
- Solving an absolute value equation of the form $|ax+b| = |cx+d|$ (5m)
- Solving for a variable in terms of other variables in a rational equation: Problem type 3 (7m)
- Solving a rational equation that simplifies to quadratic: Denominator x (3m)
- Solving a rational equation that simplifies to quadratic: Binomial denominators, constant numerators (4m)
- Solving a rational equation that simplifies to quadratic: Binomial denominators and numerators (4m)
- Solving a rational equation that simplifies to quadratic: Factorable quadratic denominator (3m)
- Solving a radical equation that simplifies to a linear equation: One radical, advanced (4m)
- Solving a radical equation that simplifies to a linear equation: Two radicals (5m)
- Solving a radical equation that simplifies to a quadratic equation: One radical, basic (5m)
- Solving a radical equation that simplifies to a quadratic equation: One radical, advanced (6m)
- Solving a radical equation that simplifies to a quadratic equation: Two radicals (5m)

Section 4.1 (1 Topic)

- Inverse functions: Quadratic, square root (13m)