Class: Spring 2021 MTH 129 Precalculus I - Section 950 (20435)
Class Code: 664QA-QYVTY
Subject: College Algebra
Instructor: Kifowit
Class Dates: 01/19/2021 - 05/14/2021
Class Content: 238 topics / 188 accessible topics
Textbook: Coburn/Coffelt: College Algebra, 3rd Ed. (McGraw-Hill)

Objectives	Dates
1. Week 1: Sections 1.1-1.2 (17 topics)	01/19/2021 12:00 AM - 01/25/2021 11:59 PM
2. Week 2: Sections 1.2-1.3 (17 topics)	01/26/2021 12:00 AM - 02/01/2021 11:59 PM
3. Week 3: Sections 1.4-1.5 (16 topics)	02/02/2021 12:00 AM - 02/08/2021 11:59 PM
4. Week 4: Sections 1.5-1.6 (20 topics)	02/09/2021 12:00 AM - 02/15/2021 11:59 PM
5. Week 5: Section 1.6 (12 topics)	02/16/2021 12:00 AM - 02/22/2021 11:59 PM
6. Week 6: Section 2.1 (12 topics)	02/23/2021 12:00 AM - 03/01/2021 11:59 PM
7. Week 7: Sections 2.2-2.3 (21 topics)	03/02/2021 12:00 PM - 03/08/2021 11:59 PM
8. Week 8: Section 2.4 (20 topics)	03/09/2021 12:00 AM - 03/22/2021 11:59 PM
9. Week 9: Section 2.5 (15 topics)	03/23/2021 12:00 AM - 03/29/2021 11:59 PM
10. Week 10: Section 3.1 (12 topics)	03/30/2021 12:00 AM - 04/05/2021 11:59 PM
11. Week11: Sect. 3.1, 3.2, 3 (19 topics)	04/06/2021 12:00 AM - 04/12/2021 11:59 PM
12. Week 12: Section 3.5-3.6 (13 topics)	04/13/2021 12:00 AM - 04/19/2021 11:59 PM
13. Week 13: Section 4.1 (9 topics)	04/20/2021 12:00 AM - 04/26/2021 11:59 PM
14. Week 14: Sections 4.2-4.4 (19 topics)	04/27/2021 12:00 AM - 05/03/2021 11:59 PM
15. Week 15: Sections 4.5-4.6 (21 topics)	05/04/2021 12:00 AM - 05/14/2021 11:59 PM

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

Week 1: Sections 1.1-1.2 (17 Topics, due on 01/25/2021 11:59 PM)

Section R.1 (1 Topic)

- Writing an inequality for a real-world situation

Section 1.1 (10 Topics)

- Solving a multi-step equation given in fractional form
- Solving a linear equation with several occurrences of the variable: Variables on both sides and distribution
- Solving a linear equation with several occurrences of the variable: Variables on both sides and two distributions
- Solving a linear equation with several occurrences of the variable: Fractional forms with monomial numerators
- Solving a two-step equation with signed fractions
- Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
- Solving a linear equation with several occurrences of the variable: Fractional forms with binomial numerators
- Solving equations with zero, one, or infinitely many solutions
- Translating a sentence into a multi-step equation
- Writing a multi-step equation for a real-world situation

Section 1.2 (7 Topics*)

- Writing an inequality for a real-world situation
- Graphing a linear inequality on the number line
- Writing an inequality given a graph on the number line
- Graphing a compound inequality on the number line
- Writing a compound inequality given a graph on the number line
- Set-builder and interval notation
- Union and intersection of finite sets

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Week 2: Sections 1.2-1.3 (17 Topics, due on 02/01/2021 11:59 PM)

Section 1.2 (7 Topics)

- Solving a two-step linear inequality: Problem type 2
- Solving a two-step linear inequality with a fractional coefficient
- Solving a linear inequality with multiple occurrences of the variable: Problem type 1
- Solving a linear inequality with multiple occurrences of the variable: Problem type 2
- Solving inequalities with no solution or all real numbers as solutions
- Solving a compound linear inequality: Graph solution, basic
- Solving a compound linear inequality: Interval notation

Section 1.3 (10 Topics)

- Solving an absolute value equation: Problem type 1
- Solving an absolute value equation: Problem type 2
- Solving an absolute value equation: Problem type 3
- Solving an absolute value equation: Problem type 4
- Solving an absolute value equation of the form $|ax+b| = |cx+d|$
- Solving an absolute value inequality: Problem type 1
- Solving an absolute value inequality: Problem type 2
- Solving an absolute value inequality: Problem type 3
- Solving an absolute value inequality: Problem type 4
- Solving an absolute value inequality: Problem type 5

Week 3: Sections 1.4-1.5 (16 Topics, due on 02/08/2021 11:59 PM)

Section 1.4 (6 Topics)

- Using i to rewrite square roots of negative numbers
- Simplifying a product and quotient involving square roots of negative numbers
- Adding or subtracting complex numbers
- Multiplying complex numbers
- Dividing complex numbers
- Simplifying a power of i

Section 1.5 (10 Topics)

- Solving an equation written in factored form
- Finding the roots of a quadratic equation of the form $ax^2 + bx = 0$
- Finding the roots of a quadratic equation with leading coefficient 1
- Finding the roots of a quadratic equation with leading coefficient greater than 1
- Solving a quadratic equation needing simplification
- Roots of a product of polynomials
- Solving an equation of the form $x^2 = a$ using the square root property
- Solving a quadratic equation using the square root property: Exact answers, basic
- Solving a quadratic equation using the square root property: Exact answers, advanced
- Completing the square

Week 4: Sections 1.5-1.6 (20 Topics, due on 02/15/2021 11:59 PM)

Section 1.5 (6 Topics)

- Applying the quadratic formula: Exact answers
- Applying the quadratic formula: Decimal answers
- Solving a quadratic equation with complex roots
- Discriminant of a quadratic equation
- Discriminant of a quadratic equation with parameter
- Solving a word problem using a quadratic equation with irrational roots

Section 1.6 (15 Topics*)

- Restriction on a variable in a denominator: Linear
- Solving a proportion of the form $a/(x+b) = c/x$
- Solving a rational equation that simplifies to linear: Denominator $x+a$
- Solving a rational equation that simplifies to linear: Denominators a, x, or ax

- Solving a rational equation that simplifies to linear: Denominators ax and bx
- Solving a rational equation that simplifies to linear: Like binomial denominators
- Solving a rational equation that simplifies to linear: Unlike binomial denominators
- Solving for a variable in terms of other variables in a rational equation: Problem type 2
- Solving a word problem using a quadratic equation with irrational roots
- Solving an equation using the odd-root property: Problem type 2
- Restriction on a variable in a denominator: Quadratic
- Solving a rational equation that simplifies to linear: Factorable quadratic denominator
- Solving a rational equation that simplifies to quadratic: Denominator x
- Solving a rational equation that simplifies to quadratic: Binomial denominators, constant numerators
- Solving a rational equation that simplifies to quadratic: Binomial denominators and numerators

Section 4.1 (1 Topic*)

- Solving a word problem using a quadratic equation with irrational roots

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Week 5: Section 1.6 (12 Topics, due on 02/22/2021 11:59 PM)

Section 1.6 (12 Topics)

- Solving a radical equation that simplifies to a linear equation: One radical, advanced
- Solving a radical equation that simplifies to a linear equation: Two radicals
- Solving a radical equation that simplifies to a quadratic equation: One radical, basic
- Solving a radical equation that simplifies to a quadratic equation: One radical, advanced
- Solving a radical equation with two radicals that simplifies to sqrt(x) = a
- Solving an equation with a root index greater than 2: Problem type 1
- Solving an equation with a root index greater than 2: Problem type 2
- Solving an equation with exponent 1/a: Problem type 1
- Solving an equation with exponent 1/a: Problem type 2
- Solving an equation with positive rational exponent
- Solving an equation that can be written in quadratic form: Problem type 1
- Solving an equation that can be written in quadratic form: Problem type 2

Week 6: Section 2.1 (12 Topics, due on 03/01/2021 11:59 PM)

Section 2.1 (12 Topics)

- Distance between two points in the plane: Exact answers
- Distance between two points in the plane: Decimal answers
- Midpoint of a line segment in the plane
- Finding a solution to a linear equation in two variables
- Graphing a parabola of the form $y = ax^2$
- Graphing a parabola of the form $y = ax^2 + c$
- Graphing a cubic function of the form $y = ax^3$
- Identifying the center and radius to graph a circle given its equation in standard form
- Writing the equation of a circle centered at the origin given its radius or a point on the circle
- Writing an equation of a circle given its center and radius or diameter
- Writing an equation of a circle given its center and a point on the circle
- Writing an equation of a circle given the endpoints of a diameter

Section 3.1 (1 Topic*)

- Graphing a cubic function of the form $y = ax^3$

Section 8.2 (2 Topics*)

- Writing an equation of a circle given its center and a point on the circle
- Writing an equation of a circle given the endpoints of a diameter

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Week 7: Sections 2.2-2.3 (21 Topics, due on 03/08/2021 11:59 PM)

Section 2.2 (7 Topics)

- Graphing a line given its equation in standard form
- Graphing a vertical or horizontal line
- Graphing a line given its x- and y-intercepts
- Finding slope given two points on the line
- Writing the equations of vertical and horizontal lines through a given point
- Identifying parallel and perpendicular lines from coordinates
- Finding the initial amount and rate of change given a graph of a linear function

Section 2.3 (14 Topics)

- Graphing a line through a given point with a given slope
- Finding the slope and y-intercept of a line given its equation in the form Ax + By = C
- Writing an equation in slope-intercept form given the slope and a point
- Finding the slope and a point on a line given its equation in point-slope form
- Graphing a line given its equation in point-slope form
- Writing an equation in point-slope form given the slope and a point
- Writing an equation of a line given the y-intercept and another point
- Writing the equation of the line through two given points
- Finding slopes of lines parallel and perpendicular to a line given in slope-intercept form
- Finding slopes of lines parallel and perpendicular to a line given in the form Ax + By = C
- Writing equations of lines parallel and perpendicular to a given line through a point
- Interpreting the parameters of a linear function that models a real-world situation
- Choosing a graph to fit a narrative: Basic
- Choosing a graph to fit a narrative: Advanced

Week 8: Section 2.4 (20 Topics, due on 03/22/2021 11:59 PM)

Section 2.4 (20 Topics)

- Vertical line test
- Evaluating functions: Linear and quadratic or cubic
- Evaluating a rational function: Problem type 1
- Evaluating a rational function: Problem type 2
- Table for a square root function
- Evaluating a cube root function
- Evaluating functions: Absolute value, rational, radical
- Variable expressions as inputs of functions: Problem type 1
- Variable expressions as inputs of functions: Problem type 2
- Variable expressions as inputs of functions: Problem type 3
- Domain of a rational function: Excluded values
- Domain of a rational function: Interval notation
- Domain of a square root function: Basic
- Domain of a square root function: Advanced
- Finding the domain of a fractional function involving radicals
- Finding inputs and outputs of a two-step function that models a real-world situation: Function notation
- Finding an output of a function from its graph
- Finding inputs and outputs of a function from its graph
- Domain and range from the graph of a continuous function
- Interpreting the graphs of two functions

Section 2.5 (1 Topic*)

- Domain and range from the graph of a continuous function

Section 3.1 (1 Topic*)

- Domain and range from the graph of a continuous function

Section 4.5 (2 Topics*)

- Domain of a rational function: Excluded values
- Domain of a rational function: Interval notation

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Week 9: Section 2.5 (15 Topics, due on 03/29/2021 11:59 PM)

Section 2.4 (1 Topic)

- Domain and range from the graph of a continuous function

Section 2.5 (15 Topics*)

- Finding intercepts of a nonlinear function given its graph
- Determining if graphs have symmetry with respect to the x-axis, y-axis, or origin
- Finding a difference quotient for a linear or quadratic function
- Finding a difference quotient for a rational function
- Domain and range from the graph of a continuous function
- Finding where a function is increasing, decreasing, or constant given the graph
- Finding where a function is increasing, decreasing, or constant given the graph: Interval notation
- Finding local maxima and minima of a function given the graph
- Finding values and intervals where the graph of a function is zero, positive, or negative
- Graphing a function of the form f(x) = ax + b: Fractional slope
- Graphing a function of the form $f(x) = ax^2$
- Graphing a function of the form $f(x) = ax^2 + c$
- Even and odd functions: Problem type 1
- Even and odd functions: Problem type 2
- Finding the average rate of change of a function

Section 3.1 (8 Topics*)

- Finding intercepts of a nonlinear function given its graph
- Domain and range from the graph of a continuous function
- Finding where a function is increasing, decreasing, or constant given the graph: Interval notation
- Finding local maxima and minima of a function given the graph
- Finding values and intervals where the graph of a function is zero, positive, or negative
- Graphing a function of the form f(x) = ax + b: Fractional slope
- Graphing a function of the form $f(x) = ax^2$
- Graphing a function of the form $f(x) = ax^2 + c$

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Week 10: Section 3.1 (12 Topics, due on 04/05/2021 11:59 PM)

Section 3.1 (10 Topics)

- Graphing an absolute value equation of the form y = A|x|
- Graphing an absolute value equation in the plane: Basic
- Graphing an absolute value equation in the plane: Advanced
- Graphing a parabola of the form $y = (x-h)^2 + k$
- Graphing a square root function: Problem type 1
- Graphing a square root function: Problem type 2
- Graphing a square root function: Problem type 3
- Graphing a cube root function
- Translating the graph of an absolute value function: Two steps
- Translating the graph of a function: Two steps

Chapter 3 Supplementary Topics (2 Topics)

- How the leading coefficient affects the shape of a parabola
- Classifying the graph of a function

Week11: Sect. 3.1, 3.2, 3 (19 Topics, due on 04/12/2021 11:59 PM)

Section 3.1 (11 Topics)

- Matching parent graphs with their equations

- Translating the graph of a parabola: One step
- Translating the graph of a parabola: Two steps
- Translating the graph of an absolute value function: One step
- Translating the graph of a function: One step
- Transforming the graph of a function by reflecting over an axis
- Transforming the graph of a function by shrinking or stretching
- Transforming the graph of a function using more than one transformation
- Transforming the graph of a quadratic, cubic, square root, or absolute value function
- Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
- Domain and range from the graph of a quadratic function

Section 3.2 (1 Topic)

- Transforming the graph of a rational function

Section 3.4 (4 Topics)

- Evaluating a piecewise-defined function
- Graphing a piecewise-defined function: Problem type 1
- Graphing a piecewise-defined function: Problem type 2
- Graphing a piecewise-defined function: Problem type 3

Chapter 3 Supplementary Topics (3 Topics)

- How the leading coefficient affects the shape of a parabola
- Writing an equation for a function after a vertical translation
- Writing an equation for a function after a vertical and horizontal translation

Section 4.1 (1 Topic*)

- Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola

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Week 12: Section 3.5-3.6 (13 Topics, due on 04/19/2021 11:59 PM)

Section 3.5 (12 Topics)

- Sum, difference, and product of two functions
- Quotient of two functions: Basic
- Quotient of two functions: Advanced
- Combining functions: Advanced
- Introduction to the composition of two functions
- Composition of two functions: Basic
- Composition of a function with itself
- Expressing a function as a composition of two functions
- Composition of two functions: Domain and range
- Composition of two functions: Advanced
- Composition of two rational functions
- Word problem involving composition of two functions

Section 3.6 (1 Topic)

- Rewriting a multivariate function as a univariate function given a relationship between its variables

Week 13: Section 4.1 (9 Topics, due on 04/26/2021 11:59 PM)

Section 3.1 (1 Topic)

- Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola

Section 4.1 (9 Topics*)

- Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
- Graphing a parabola of the form $y = x^2 + bx + c$
- Graphing a parabola of the form $y = a(x-h)^2 + k$
- Graphing a parabola of the form $y = ax^2 + bx + c$: Integer coefficients
- Graphing a parabola of the form $y = ax^2 + bx + c$: Rational coefficients

- Finding the x-intercept(s) and the vertex of a parabola
- Rewriting a quadratic function to find its vertex and sketch its graph
- Finding the maximum or minimum of a quadratic function
- Writing the equation of a quadratic function given its graph

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Week 14: Sections 4.2-4.4 (19 Topics, due on 05/03/2021 11:59 PM)

Section 1.5 (1 Topic)

- Writing a quadratic equation given the roots and the leading coefficient

Section 4.2 (8 Topics)

- Finding a polynomial of a given degree with given zeros: Real zeros
- Polynomial long division: Problem type 1
- Polynomial long division: Problem type 2
- Polynomial long division: Problem type 3
- Synthetic division
- Using the remainder theorem to evaluate a polynomial
- The Factor Theorem
- Using a given zero to write a polynomial as a product of linear factors: Real zeros

Section 4.3 (4 Topics)

- Finding zeros and their multiplicities given a polynomial function written in factored form
- Multiplying expressions involving complex conjugates
- Finding a polynomial of a given degree with given zeros: Complex zeros
- Using a given zero to write a polynomial as a product of linear factors: Complex zeros

Section 4.4 (7 Topics*)

- Finding zeros of a polynomial function written in factored form
- Finding zeros and their multiplicities given a polynomial function written in factored form
- Finding x- and y-intercepts given a polynomial function
- Determining the end behavior of the graph of a polynomial function
- Determining end behavior and intercepts to graph a polynomial function
- Matching graphs with polynomial functions
- Inferring properties of a polynomial function from its graph

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Week 15: Sections 4.5-4.6 (21 Topics, due on 05/14/2021 11:59 PM)

Section 2.4 (2 Topics)

- Domain of a rational function: Excluded values
- Domain of a rational function: Interval notation

Section 2.5 (1 Topic)

- Finding x- and y-intercepts of the graph of a nonlinear equation

Section 4.5 (11 Topics*)

- Domain of a rational function: Excluded values
- Domain of a rational function: Interval notation
- Finding the asymptotes of a rational function: Constant over linear
- Finding the asymptotes of a rational function: Linear over linear
- Finding horizontal and vertical asymptotes of a rational function: Quadratic numerator or denominator
- Finding the asymptotes of a rational function: Quadratic over linear
- Graphing a rational function: Constant over linear
- Graphing a rational function: Linear over linear
- Graphing a rational function: Quadratic over linear
- Matching graphs with rational functions: Two vertical asymptotes

- Graphing a rational function with more than one vertical asymptote

Section 4.6 (9 Topics)

- Writing a quadratic function given its zeros
- Solving a quadratic inequality written in factored form
- Solving a quadratic inequality
- Solving a polynomial inequality: Problem type 1
- Solving a polynomial inequality: Problem type 2
- Solving a polynomial inequality: Problem type 3
- Solving a polynomial inequality: Problem type 4
- Solving a rational inequality: Problem type 1
- Solving a rational inequality: Problem type 2

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