

Prep for Calculus

This course covers the topics shown below.

Students navigate learning paths based on their level of readiness.

Institutional users may customize the scope and sequence to meet curricular needs.

Curriculum

- Real Numbers
 - ◆ Fractions
 - ◇ Simplifying a fraction
 - ◇ Ordering fractions
 - ◇ Addition or subtraction of fractions with different denominators
 - ◇ Fraction multiplication
 - ◇ Fraction division
 - ◇ Fractional part of a circle
 - ◆ Proportion and Percent
 - ◇ Converting a fraction to a percentage
 - ◇ Converting a percentage to a fraction
 - ◇ Converting between percentages and decimals
 - ◇ Percentage of a whole number
 - ◇ Word problem on percentage: Problem type 1
 - ◇ Word problem on percentage: Problem type 2
 - ◇ Word problem on percentage: Problem type 3
 - ◇ Basic word problem on rates
 - ◇ Solving a proportion: Basic
 - ◇ Word problem on proportions: Problem type 1
 - ◆ Integers and Signed Numbers
 - ◇ Absolute value of a number
 - ◇ Operations with absolute value
 - ◇ Integer addition: Problem type 2
 - ◇ Integer subtraction
 - ◇ Integer multiplication and division
 - ◇ Signed fraction multiplication
 - ◇ Signed fraction addition
 - ◇ Signed decimal addition
 - ◇ Evaluating expressions with exponents: Problem type 1
 - ◇ Exponents and order of operations
 - ◆ Number Systems
 - ◇ Integers and rational numbers
 - ◇ Rational and irrational numbers
 - ◇ Properties of addition
 - ◇ Properties of real numbers
- Equations and Inequalities
 - ◆ Linear Equations
 - ◇ Evaluation of a linear expression in two variables
 - ◇ Additive property of equality: Problem type 2
 - ◇ Multiplicative property of equality: Problem type 2

- ◇ Solving a linear equation: Problem type 1
- ◇ Solving a linear equation: Problem type 2
- ◇ Solving a linear equation: Problem type 3
- ◇ Solving a linear equation with several occurrences of the variable: Problem type 1
- ◇ Solving a linear equation with several occurrences of the variable: Problem type 2
- ◇ Solving a linear equation with several occurrences of the variable: Problem type 3
- ◇ Solving a linear equation with several occurrences of the variable: Problem type 4
- ◇ Solving a linear equation with several occurrences of the variable: Problem type 5
- ◇ Solving a word problem using a linear equation: Problem type 1
- ◇ Solving a word problem using a linear equation: Problem type 2
- ◇ Solving a word problem using a linear equation: Problem type 3
- ◇ Solving a word problem using a linear equation: Problem type 4
- ◆ Linear Inequalities and Absolute Values
 - ◇ Solving a linear inequality: Problem type 2
 - ◇ Solving a linear inequality: Problem type 3
 - ◇ Solving a linear inequality: Problem type 4
 - ◇ Solving an equation involving absolute value: Basic
 - ◇ Solving an equation involving absolute value: Advanced
 - ◇ Solving an inequality involving absolute value: Basic
- ◆ Systems of Linear Equations
 - ◇ Solving a system of linear equations
- ◆ Quadratic Equations
 - ◇ Solving equations written in factored form
 - ◇ 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
 - ◇ Writing a quadratic equation given the roots and the leading coefficient
 - ◇ Solving a quadratic equation using the quadratic formula
 - ◇ Solving a word problem using a quadratic equation with rational roots
 - ◇ Solving a word problem using a quadratic equation with irrational roots
- Linear and Quadratic Functions
 - ◆ Graphs and Functions
 - ◇ Set builder and interval notation
 - ◇ Union and intersection of intervals
 - ◇ Reading a point in the coordinate plane
 - ◇ Plotting a point in the coordinate plane
 - ◇ Introduction to functions: Notation and graphs
 - ◇ Sum, difference, and product of two functions
 - ◇ Domain and range: Problem type 1
 - ◇ Domain and range: Problem type 2
 - ◇ Domain and range: Problem type 3
 - ◇ Range of a real-valued function
 - ◇ Vertical translation of the graph of a function
 - ◇ Vertical and horizontal translations of the graph of a function
 - ◇ Classifying the graph of a function
 - ◇ Computing outputs for piecewise-defined functions
 - ◇ Graphing piecewise-defined functions
 - ◆ Linear Functions
 - ◇ Solutions to a linear equation in two variables: Problem type 1
 - ◇ Solutions to a linear equation in two variables: Problem type 2
 - ◇ Y-intercept of a line
 - ◇ X- and y-intercepts of a line given the equation in standard form

- ◇ Finding the slope of a line given its equation
- ◇ Determining the slope of a line given its graph
- ◇ Graphing a line given the x - and y -intercepts
- ◇ Graphing a line given its equation in slope–intercept form
- ◇ Graphing a line given its equation in standard form
- ◇ Graphing a vertical or horizontal line
- ◇ Graphing a line through a given point with a given slope
- ◇ Graphing an equation involving absolute value in the plane
- ◇ Writing an equation of a line given the y -intercept and a point
- ◇ Writing the equation of a line given the slope and a point on the line
- ◇ Writing the equations of vertical and horizontal lines through a given point
- ◇ Writing the equation of the line through two given points
- ◇ Slopes of parallel and perpendicular lines: Problem type 1
- ◇ Slopes of parallel and perpendicular lines: Problem type 2
- ◇ Writing equations and drawing graphs to fit a narrative
- ◇ Application problem with a linear function: Problem type 1
- ◇ Application problem with a linear function: Problem type 2
- ◇ Interpreting the graphs of two functions
- ◆ Parabolas
 - ◇ Finding the x -intercept(s) and the vertex of a parabola
 - ◇ Graphing a parabola: Problem type 1
 - ◇ Graphing a parabola: Problem type 2
 - ◇ Graphing a parabola: Problem type 3
- Exponents and Polynomials
 - ◆ Integer Exponents
 - ◇ Product rule of exponents
 - ◇ Product rule of exponents in a multivariate monomial
 - ◇ Quotients of expressions involving exponents
 - ◇ Multiplying monomials
 - ◇ Power rule: Positive exponents
 - ◇ Ordering numbers with positive exponents
 - ◇ Writing a positive number without a negative exponent
 - ◇ Writing a negative number without a negative exponent
 - ◇ Power rule: Negative exponents
 - ◇ Ordering numbers with negative exponents
 - ◆ Polynomial Arithmetic
 - ◇ Evaluation of a polynomial in one variable
 - ◇ Simplifying a polynomial expression
 - ◇ Degree of a multivariate polynomial
 - ◇ Multiplying two binomials
 - ◇ Squaring a binomial
 - ◇ Multiplying polynomials
 - ◇ Polynomial long division: Problem type 1
 - ◆ Factoring
 - ◇ Greatest common factor of two monomials
 - ◇ Least common multiple of two monomials
 - ◇ Factoring a quadratic with leading coefficient 1
 - ◇ Factoring a quadratic with leading coefficient greater than 1
 - ◇ Factoring a difference of squares
 - ◇ Factoring with repeated use of the difference of squares formula
 - ◇ Factoring a sum or difference of two cubes
 - ◇ Factoring a product of a quadratic trinomial and a monomial

- ◇ Completing the square
- ◆ Polynomial Equations and Functions
 - ◇ Graphing a simple cubic function
 - ◇ Inferring properties of a polynomial function from its graph
 - ◇ Solving a word problem involving a polynomial of degree 3
 - ◇ Solving a word problem by finding a local extremum of a polynomial function
- Rational Expressions
 - ◆ Rational Expressions
 - ◇ Ordering fractions with variables
 - ◇ Ratio of multivariate polynomials
 - ◇ Simplifying a ratio of polynomials: Problem type 1
 - ◇ Simplifying a ratio of polynomials: Problem type 2
 - ◇ Multiplying rational expressions: Problem type 1
 - ◇ Multiplying rational expressions: Problem type 2
 - ◇ Dividing rational expressions
 - ◇ Complex fraction: Problem type 1
 - ◇ Adding rational expressions with common denominator
 - ◇ Adding rational expressions
 - ◇ Adding rational expressions with different denominators
 - ◇ Adding and subtracting rational expressions: Problem type 1
 - ◇ Partial fraction decomposition
 - ◆ Rational Equations
 - ◇ Solving a rational equation that simplifies to a linear equation: Problem type 1
 - ◇ Solving a rational equation that simplifies to a linear equation: Problem type 2
 - ◇ Solving a rational equation that simplifies to a linear equation: Problem type 3
 - ◇ Solving a rational equation that simplifies to a quadratic equation: Problem type 1
 - ◇ Solving a rational equation that simplifies to a quadratic equation: Problem type 2
 - ◇ Solving a rational equation that simplifies to a quadratic equation: Problem type 3
 - ◆ Applications of Rational Expressions
 - ◇ Algebraic symbol manipulation
 - ◇ Word problem on direct variation
 - ◇ Word problem on inverse variation
 - ◇ Word problem on inverse proportions
 - ◇ Word problem involving multiple rates
 - ◆ Rational Functions
 - ◇ Quotient of two functions
 - ◇ Sketching the graph of a rational function: Problem type 1
 - ◇ Sketching the graph of a rational function: Problem type 2
- Radical Expressions
 - ◆ Radical Expressions
 - ◇ Square root of a perfect square
 - ◇ Square root of a rational perfect square
 - ◇ Square root simplification
 - ◇ Square root addition
 - ◇ Square root multiplication
 - ◇ Simplifying a radical expression: Problem type 1
 - ◇ Simplifying a radical expression: Problem type 2
 - ◇ Simplifying a product of radical expressions
 - ◇ Simplifying a product of radical expressions using the distributive property
 - ◇ Rationalizing the denominator of a radical expression
 - ◇ Rationalizing the denominator of a radical expression using conjugates

- ◇ Solving an equation with radicals: Problem type 1
- ◇ Solving an equation with radicals: Problem type 2
- ◇ Domain of a square root function
- ◆ Higher Roots and Rational Exponents
 - ◇ Cube root of an integer
 - ◇ Converting between radical form and exponent form
 - ◇ Rational exponents: Basic
 - ◇ Rational exponents: Negative exponents and fractional bases
 - ◇ Rational exponents: Powers of powers
 - ◇ Even root property
 - ◇ Odd root property
- Exponentials and Logarithms
 - ◆ Function Compositions and Inverse Functions
 - ◇ Composition of two functions: Basic
 - ◇ Composition of two functions: Advanced
 - ◇ Inverse functions: Basic
 - ◇ Inverse functions: Advanced
 - ◆ Properties of Logarithms
 - ◇ Exponential and logarithmic equations
 - ◇ Evaluating a logarithmic expression
 - ◇ Basic properties of logarithms
 - ◇ Change of base for logarithms: Problem type 1
 - ◇ Change of base for logarithms: Problem type 2
 - ◆ Exponential and Logarithmic Equations
 - ◇ Solving an exponential equation: Problem type 1
 - ◇ Solving an exponential equation: Problem type 2
 - ◇ Solving a logarithmic equation: Problem type 1
 - ◇ Solving a logarithmic equation: Problem type 2
 - ◇ Solving a word problem using an exponential equation: Problem type 1
 - ◇ Solving a word problem using an exponential equation: Problem type 2
 - ◇ Solving a word problem using an exponential equation: Problem type 3
 - ◇ Solving a word problem using an exponential equation: Problem type 4
 - ◆ Exponential and Logarithmic Functions
 - ◇ Sketching the graph of an exponential function: Basic
 - ◇ Sketching the graph of an exponential function: Advanced
 - ◇ Sketching the graph of a logarithmic function
 - ◇ Translating the graph of a logarithmic or exponential function
- Geometry and Trigonometry
 - ◆ Perimeter, Area, and Volume
 - ◇ Perimeter of a square or a rectangle
 - ◇ Area of a square or a rectangle
 - ◇ Area of a piecewise rectangular figure
 - ◇ Finding the side length of a rectangle given its perimeter or area
 - ◇ Area and perimeter of a rectangle
 - ◇ Circumference and area of a circle
 - ◇ Perimeter involving rectangles and circles
 - ◇ Circumference ratios
 - ◇ Area between two concentric circles
 - ◇ Arc length and area of a sector of a circle
 - ◇ Area involving rectangles and circles: Advanced problem
 - ◇ Volume of a cube or a rectangular prism

- ◇ Volume of a cylinder
- ◇ Volume of a cone
- ◇ Volume of a sphere
- ◇ Rate of filling of a solid
- ◇ Ratio of volumes
- ◇ Surface area of a cube or a rectangular prism
- ◇ Surface area of a cylinder
- ◆ Coordinate Geometry
 - ◇ Pythagorean Theorem
 - ◇ Distance between two points in the plane
 - ◇ Midpoint of a line segment in the plane
 - ◇ Graphing a circle given its equation in standard form
 - ◇ Graphing a circle given its equation in general form
- ◆ Right Angle Trigonometry
 - ◇ Converting between degree and radian measure
 - ◇ Coterminal angles
 - ◇ Sketching an angle in standard position
 - ◇ Sine, cosine, and tangent ratios
 - ◇ Using a trigonometric ratio to find a side length in a right triangle
 - ◇ Using a trigonometric ratio to find an angle measure in a right triangle
 - ◇ Finding trigonometric ratios given a right triangle
 - ◇ Common angles and trigonometric functions
 - ◇ Finding values of trigonometric functions given information about an angle: Problem type 1
 - ◇ Finding values of trigonometric functions given information about an angle: Problem type 2
 - ◇ Finding values of trigonometric functions given information about an angle: Problem type 3
- ◆ Trigonometric Functions
 - ◇ Sketching the graph of a sine or cosine function: Problem type 1
 - ◇ Sketching the graph of a sine or cosine function: Problem type 2
 - ◇ Values of inverse trigonometric functions
 - ◇ Composition of a trigonometric function and an inverse trigonometric function: Problem type 1
 - ◇ Composition of a trigonometric function and an inverse trigonometric function: Problem type 2
 - ◇ Composition of a trigonometric function and an inverse trigonometric function: Problem type 3
- ◆ Trigonometric Identities and Equations
 - ◇ Cofunction identities
 - ◇ Double-angle identities
 - ◇ Product-to-sum and sum-to-product identities
 - ◇ Solving a basic trigonometric equation involving sine or cosine
 - ◇ Solving a basic trigonometric equation involving tangent, cotangent, secant, or cosecant
- ◆ Polar Coordinates
 - ◇ Plotting a point in polar coordinates
 - ◇ Converting rectangular coordinates to polar coordinates
 - ◇ Converting polar coordinates to rectangular coordinates
 - ◇ Converting an equation written in rectangular coordinates to one written in polar form
 - ◇ Converting an equation written in polar form to one written in rectangular coordinates
- Limits and Continuity
 - ◆ Introduction to Limits
 - ◇ Estimating a limit numerically
 - ◇ Finding limits from a graph
 - ◆ Computing Limits Algebraically
 - ◇ Finding limits for a piecewise-defined function
 - ◇ Finding a limit by using the limit laws: Problem type 1
 - ◇ Finding a limit by using the limit laws: Problem type 2

- ◇ Finding a limit by using the limit laws: Problem type 3
- ◇ Squeeze Theorem
- ◆ Continuity
 - ◇ Determining points of discontinuity from a graph
 - ◇ Determining a parameter to make a function continuous
- ◆ Limits Involving Infinity
 - ◇ Limits at infinity and graphs
 - ◇ Limits at infinity and rational functions
 - ◇ Infinite limits and graphs
 - ◇ Infinite limits and rational functions
- ◆ Limits of Trigonometric Functions
 - ◇ Finding a limit of a trigonometric function by using continuity
 - ◇ Finding a limit by using special trigonometric limits