

**Pre-Calculus
MATH 119
Fall 2013**

Learning Objectives

Section 1.1

Section objectives

1. Use the Distance Formula
2. Use the Midpoint Formula
4. Graph Equations Using a Graphing Utility
5. Use a Graphing Utility to Create Tables
6. Find Intercepts from a Graph
7. Use a Graphing Utility to Approximate Intercepts

Section 1.3

Section objectives

1. Solve Equations Using a Graphing Utility

Section A.10

Section objectives

1. Work with n th Roots
2. Simplify Radicals
3. Rationalize Denominators
4. Solve Radical Equations

Section 1.4

Section objectives

1. Calculate and Interpret the Slope of a Line
2. Graph Lines Given a Point and the Slope
3. Find the Equation of a Vertical Line
4. Use the Point-Slope Form of a Line; Identify Horizontal Lines
5. Find the Equation of a Line Given Two Points
6. Write the Equation of a line in Slope-intercept Form
7. Identify the Slope and y-Intercept of a Line from Its Equation
8. Graph Lines Written in General Form Using Intercepts
9. Find Equations of Parallel Lines
10. Find Equations of Perpendicular Lines

Section 1.5

Section objectives

1. Write the Standard Form of the Equation of a Circle
2. Graph a Circle by hand and by Using a Graphing Utility

Section 2.1

Section objectives

1. Determine Whether a Relation Represents a Function
2. Find the Value of a Function
3. Find the Domain of a Function Defined by an Equation
4. Form the Sum, Difference, Product, and Quotient of Two Functions

Section 2.2

Section objectives

1. Identify the Graph of a Function
2. Obtain Information from or about the Graph of a Function

Section A.9

Section objectives

1. Use Interval Notation
2. Use Properties of Inequalities
3. Solve Inequalities
4. Solve Combined Inequalities
5. Solve Inequalities Involving Absolute Value

Section 2.3

Section objectives

1. Determine Even and Odd Functions from a Graph
2. Identify Even and Odd Functions from the Equation
3. Use a Graph to Determine Where a Function is Increasing, Decreasing, or Constant
4. Use a Graph to Locate Local Maxima and Local Minima
5. Use a Graph to Locate the Absolute Maximum and the Absolute Minimum
6. Use a Graphing Utility to Approximate Local Maxima and Local Minima and to Determine Where a Function is Increasing or Decreasing
7. Find the Average Rate of Change of a Function

Section 2.4

Section objectives

1. Graph the Functions Listed in the Library of Functions
2. Graph Piecewise-defined Functions

Section A.6

Section objectives

1. Solve Linear Equations
2. Solve Rational Equations
3. Solve Quadratic Equations by Factoring
4. Solve Quadratic Equations Using the Square Root method
5. Solve Quadratic Equations by Completing the Square
6. Solve Quadratic Equations Using the Quadratic Formula
7. Solve Equations in Quadratic Form
8. Solve Absolute Value Equations
9. Solve Equations by Factoring

Section 2.5

Section objectives

1. Graph Functions Using Vertical and Horizontal Shifts
2. Graph Functions Using Compressions and Stretches
3. Graph Functions Using Reflections about the x -Axis or y -Axis

Section 2.6

Section objectives

1. Build and Analyze Functions

Section 3.1

Section objectives

1. Graph Linear Functions
2. Use Average Rate of Change to Identify Linear Functions
3. Determine Whether a Linear Function Is Increasing, Decreasing, or Constant
4. Build Linear Models from Verbal Descriptions

Section 3.3

Section objectives

1. Graph a Quadratic Function Using Transformations
2. Identify the Vertex and Axis of Symmetry of a Quadratic Function
3. Graph a Quadratic Function Using Its Vertex, Axis, and Intercepts
5. Find the Maximum or Minimum Value of a Quadratic Function

Section A.7

Section objectives

2. Solve Quadratic Equations in the Complex Number System

Section 3.4

Section objectives

1. Build Quadratic Models from Verbal Descriptions

Section 3.5

Section objectives

1. Solve Inequalities Involving a Quadratic Function

Section 4.1

Section objectives

1. Identify Polynomial Functions and Their Degree
2. Graph Polynomial Functions Using Transformations
3. Identify the Real Zeros of a Polynomial Function and Their Multiplicity
4. Analyze the Graph of a Polynomial Function

Section A.3

Section objectives

1. Recognize Monomials
2. Recognize Polynomials
3. Know Formulas for Special Products
4. Divide Polynomials Using Long Division
5. Factor Polynomials
6. Complete the Square

Section A.4

Section objectives

1. Divide Polynomials Using Synthetic Division

Section 4.4

Section objectives

1. Find the Domain of a Rational Function
2. Find the Vertical Asymptotes of a Rational Function
3. Find the Horizontal or Oblique Asymptote of a Rational Function

Section 4.5

Section objectives

1. Analyze the Graph of a Rational Function
2. Solve Applied Problems Involving Rational Functions

Section 5.1

Section objectives

1. Form a Composite Function
2. Find the Domain of a Composite Function

Section 5.2

Section objectives

1. Determine Whether a Function Is One-to-One
2. Determine the Inverse of a Function Defined by a Map or a Set of Ordered Pairs
3. Obtain the Graph of the Inverse Function from the Graph of the Function
4. Find the Inverse of a Function Defined by an Equation

Section 5.3

Section objectives

1. Evaluate Exponential Functions
2. Graph Exponential Functions
3. Define the Number e
4. Solve Exponential Equations

Section 5.4

Section objectives

1. Change Exponential Statements to Logarithmic Statements, and Logarithmic Statements and Logarithmic Statements to Exponential Statements
2. Evaluate Logarithmic Expressions
3. Determine the Domain of a Logarithmic Function
4. Graph Logarithmic Functions
5. Solve Logarithmic Equations

Section 5.5

Section objectives

1. Work with the Properties of Logarithms
2. Write a Logarithmic Expression as a Sum or Difference of Logarithms
3. Write a Logarithmic Expression as a Single Logarithm
4. Evaluate a Logarithm Whose Base Is Neither 10 Nor e
5. Graph a Logarithmic Function Whose Base Is Neither 10 Nor e

Section 5.6

Section objectives

1. Solve Logarithmic Equations
2. Solve Exponential Equations
3. Solve Logarithmic and Exponential Equations Using a Graphing Utility

Section 5.7

Section objectives

1. Determine the Future Value of a Lump sum of Money
3. Determine the Present Value of a Sump Sum of Money
4. Determine the Rate of Interest or Time Required to Double a Lump Sum of Money

Section 5.8

Section objectives

1. Find Equations of Populations That Obey the Law of Uninhibited Growth
2. Find Equations of Populations That Obey the Law of Decay

Section 6.1

Section objectives

1. Convert between Decimals and Degrees, Minutes, Seconds Measures for Angles
2. Find the Length of an Arc of a Circle
3. Convert from Degrees to Radians and from Radians to Degrees

Section 8.1

Section objectives

1. Find the Value of Trigonometric Functions of Acute Angles Using Right Triangles
2. Use the Complementary Angle Theorem
3. Solve Right Triangles
4. Solve Applied Problems

Section 8.2

Section objectives

1. Solve SAA or ASA Triangles
3. Solve Applied Problems

Section 8.3

Section objectives

1. Solve SAS Triangles
2. Solve SSS Triangles
3. Solve Applied Problems

Section 6.2

Section objectives

1. Find the Exact Values of the Trigonometric Functions Using a Point on the Unit Circle
2. Find the Exact Values of the Trigonometric Functions of Quadrantal Angles
3. Find the Exact Values of the Trigonometric Functions of $\frac{\pi}{4} = 45^\circ$
4. Find the Exact Values of the Trigonometric Functions of $\frac{\pi}{6} = 30^\circ$ and $\frac{\pi}{3} = 60^\circ$
5. Find the Exact Values of the Trigonometric Functions for Integer Multiplies of $\frac{\pi}{6} = 30^\circ$, $\frac{\pi}{4} = 45^\circ$, and $\frac{\pi}{3} = 60^\circ$
6. Use a Calculator to Approximate the Value of a Trigonometric Function
7. Use a Circle of Radius r to Evaluate the Trigonometric Functions

Section 6.3

Section objectives

1. Determine the Domain and the Range of the Trigonometric Functions
2. Determine the Period of the Trigonometric Functions
3. Determine the Signs of the Trigonometric Functions in a Given Quadrant
4. Find the Values of the Trigonometric Functions Using Fundamental Identities
5. Find the Exact Values of the Trigonometric Functions of an Angle Given One of the Functions and the Quadrant of the Angle

Section 6.4

Section objectives

1. Graph Functions of the Form $y = A \sin(\omega x)$ Using Transformations
2. Graph Functions of the Form $y = A \cos(\omega x)$ Using Transformations
3. Determine the Amplitude and Period of Sinusoidal Functions
4. Graph Sinusoidal Functions Using Key Points
5. Find an Equation for a Sinusoidal Graph

Section 6.5

Section objectives

1 (modified). Graph the Following Functions:

$$y = \tan x$$

$$y = \cot x$$

$$y = \csc x$$

$$y = \sec x$$

Section 7.1

Section objectives

1. Find the Exact Value of the Inverse Sine Function
2. Find an Approximate Value of an Inverse Sine Function
3. Use Properties of Inverse Functions to Find Exact Values of Certain Composite Functions
4. Find the Inverse Function of a Trigonometric Function
5. Solve Equations Involving Inverse Trigonometric Functions

Section 7.2

Section objectives

1. Find the Exact Value of Expressions Involving the Inverse Sine, Cosine, and Tangent Functions
3. Use a Calculator to Evaluate $\sec^{-1} x$, $\csc^{-1} x$, and $\cot^{-1} x$
4. Write a Trigonometric Expression as an Algebraic Expression

Section 7.3

Section objectives

1. Solve Equations Involving a Single Trigonometric Function
2. Solve Trigonometric Equations Using a Calculator
4. Solve Trigonometric Equations Using Fundamental Identities
5. Solve Trigonometric Equations Using a Graphing Utility

Section 7.4

Section objectives

1. Use Algebra to Simplify Trigonometric Expressions
2. Establish Identities