LSU Dual Enrollment Program for Math
Advanced Math Precalculus COURSE PROFILE 11-14-2025

ETEXT: ***Algebra & Trigonometry with Interactive Assessments, 4e, MyLab Math*****, Kirk Trigsted**
HIGH SCHOOL COURSE CODE: 160346

CHAPTERS
1 – Equations, Inequalities, and Applications
2 – The Rectangular Coordinate System, Lines, and Circles
3 – Functions
4 – Polynomial and Rational Functions
5 – Exponential and Logarithmic Functions and Equations
6 – An Introduction to Trigonometric Functions
7 – The Graphs of Trigonometric Functions
8 – Trigonometric Identities, Formulas, and Equations
9 – Applications of Trigonometry
10 – Polar Equations, Complex Numbers, and Vectors
12 – Systems of Equations

The number in parentheses indicates the number of homework exercises on that topic in MyLab Math.

Chapter 1: Equations, Inequalities, and Applications

Section 1.1 Linear and Rational Equations (52)

Determine whether equations are linear or nonlinear
Solve linear equations with integer coefficients
Solve linear equations involving fractions
Solve linear equations involving decimals
Identify rational equations
Solve rational equations that lead to linear equations

Section 1.4 Quadratic Equations (44)

Solve quadratic equations by factoring
Solve quadratic equations using the square root property
Solve quadratic equations using the quadratic formula
Use the discriminant to determine the type of solutions of a quadratic equation

Section 1.6 Other Types of Equations (43)

Solve higher-order polynomial equations
Solve equations that are quadratic in form
Solve equations involving single radicals

Section 1.7 Linear Inequalities (33)

Solve linear inequalities in one variable

Solve three-part inequalities in one variable

Section 1.8 Absolute Value Equations and Inequalities (16)

Solve absolute value equations

Chapter 2: The Rectangular Coordinate System, Lines, and Circles

Section 2.1 The Rectangular Coordinate System (28)

Plot ordered pairs
Determine if an ordered pair lies on a graph
Find intercepts of graphs from equations
Find the midpoint of a line segment using the midpoint formula
Find the distance between two points using the distance formula

Section 2.2 Circles (31)

Write the standard form of an equation of a circle
Find the center, radius, and intercepts and sketch the graph of circles given equations in standard form
Find the center, radius, and intercepts and sketch the graph of circles given equations in general form

Section 2.3 Lines (54)

Find the slopes of lines that pass through two given points
Sketch the graph of a line given a point and the slope
Find the equation of a line in point-slope form
Find the equation of a line in slope-intercept form
Find the equation of a line in standard form
Find the slope and the y-intercept of a line in standard form and sketch the graph
Sketch the graphs of lines given in standard form by plotting intercepts
Find equations of horizontal lines and vertical lines

Section 2.4 Parallel and Perpendicular Lines (31)

Determine whether two lines are parallel, perpendicular, or neither
Find the equations of lines parallel to given lines
Find the equations of lines perpendicular to given lines

Chapter 3: Functions

Section 3.1 Relations and Functions (56)

Find the domain and range of relations, and determine if relations represent functions
Determine whether equations represent functions
Use function notation to identify points that lie on graphs of functions
Evaluate functions at given values
Determine difference quotients
Use the vertical line test to determine if graphs represent functions
Classify functions as polynomials, rational functions, or root functions, and find their domains

Section 3.2 Properties of a Function's Graph (44)

Determine the intercepts of a function

Determine the domain and range of functions from their graphs
Determine where functions are increasing, decreasing, or constant
Determine relative maximum and relative minimum values of a function
Determine whether a function is even, odd, or neither
Use graphs to evaluate or compare functions
Identify function properties from graphs

Section 3.3 Graphs of Basic Functions; Piecewise Functions (41)

Sketch the graphs of the basic functions
Sketch graphs of basic functions with restricted domains
Determine functions and their domains from graphs of piecewise-defined functions
Graph and determine properties of piecewise-defined functions

Section 3.4 Transformations of Functions (54)

Use vertical shifts to graph functions
Use horizontal shifts to graph functions
Use reflections to graph functions
Use vertical stretches and compressions to graph functions
Use combinations of transformations to graph functions
Use transformations to sketch the graphs of piecewise-defined functions

Section 3.5 Composite Functions (19)

Find composite functions
Evaluate composite functions at a given point

Section 3.6 One-to-One Functions; Inverse Functions (45)

Determine if functions are one-to-one
Determine whether a function is one-to-one using the horizontal line test
Determine if functions are inverses of one another
Find inverses of one-to-one functions
Sketch the graphs of inverse functions
Use the graph of a function to determine properties of its inverse

Chapter 4: Polynomial and Rational Functions

Section 4.1 Quadratic Functions (39)

Determine whether the graph of a quadratic function opens up or down
Determine properties of quadratic function in vertex form and graph the function
Determine properties of quadratic function using the vertex formula and graph the function
Determine the equation of a quadratic function given its graph

Section 4.2 Applications of Quadratic Functions (11)

Solve applications involving the maximum of projectile motion functions
Solve applications involving the maximum of functions in economics

Section 4.3 Graphs of Polynomial Functions (47)

Identify polynomial functions and their degree, leading coefficient, and constant coefficient
Sketch the graphs of power functions using transformations
Use the end behavior of polynomial functions to describe the equation of the function
Determine the intercepts of a polynomial function

Determine the real zeros of polynomial functions and their multiplicities
Sketch the graph of a polynomial function using the four-step process
Determine a possible equation of a polynomial function given its graph

Section 4.6 Rational Functions and Their Graphs (40)

Find the domain and intercepts of rational functions
Identify vertical asymptotes of rational functions
Identify horizontal asymptotes of rational functions
Use transformations to sketch the graphs of rational functions
Find removable discontinuities, intercepts, and asymptotes and sketch graphs of rational functions

Chapter 5: Exponential and Logarithmic Functions and Equations

Section 5.1 Exponential Functions (52)

Evaluate exponential expressions
Sketch the graphs of exponential functions
Determine possible equations of exponential functions given their graphs
Sketch the graphs of exponential functions using transformations
Solve exponential equations by relating the bases
Solve applications involving exponential functions

Section 5.2 Logarithmic Functions (55)

Change equations between exponential form and logarithmic form
Evaluate logarithmic expressions
Use properties of logarithms to evaluate expressions
Use common and natural logarithms
Sketch the graphs of logarithmic functions
Find the domain of logarithmic functions

Section 5.3 Properties of Logarithms (36)

Expand and evaluate logarithmic expressions using properties of logarithms
Condense and evaluate logarithmic expressions using properties of logarithms
Solve logarithmic equations using the logarithm property of equality
Use the change of base formula to approximate logarithmic expressions
Use the change of base formula to solve logarithmic equations

Section 5.4 Exponential and Logarithmic Equations (46)

Solve exponential equations
Solve logarithmic equations

Section 5.5 Applications of Exponential and Logarithmic Functions (19)

Solve applications involving compound interest
Solve exponential growth and decay applications

Chapter 6: An Introduction to Trigonometric Functions

Section 6.1 An Introduction to Angles: Degree and Radian Measure (48)

Understand degree measure

Understand radian measure
Convert between degree measure and radian measure
Find coterminal angles using degree measure
Find coterminal angles using radian measure

Section 6.2 Applications of Radian Measure (18)

Determine the area of a sector of a circle
Determine the arc length of a sector of a circle

Section 6.4 Right Triangle Trigonometry (42)

Understand the right triangle definitions of the trigonometric functions
Use the special right triangles
Understand the fundamental trigonometric identities
Understand cofunctions
Evaluate trigonometric functions using a calculator

Section 6.5 Trigonometric Functions of General Angles (73)

Understand the four families of special angles
Understand the definitions of the trigonometric functions of general angles
Find the values of the trigonometric functions of quadrantal angles
Understand the signs of the trigonometric functions
Find trigonometric function values given another function value
Determine reference angles
Evaluate trigonometric functions of angles belonging to the $\frac{\pi}{3}$, $\frac{\pi}{4}$, and $\frac{\pi}{6}$ families

Section 6.6 The Unit Circle (12)

Understand the definition of the unit circle
Understand the unit circle definitions of the trigonometric functions

Chapter 7: The Graphs of Trigonometric Functions

Section 7.1 Graphs of Sine and Cosine Functions (36)

Understand the graph of the sine function and its properties
Understand the graph of the cosine function and its properties
Determine properties and sketch graphs of the form $y = A\sin x$ and $y = A\cos x$
Determine properties and sketch graphs of the form $y = \sin Bx$ and $y = \cos Bx$
Determine properties and sketch graphs of the form $y = A\sin Bx$ and $y = A\cos Bx$
Determine the equation of a function of the form $y = A\sin Bx$ and $y = A\cos Bx$ given its graph

Section 7.2 Graphs of Sine and Cosine: Phase Shift & Vertical Shift (29)

Determine properties and sketch graphs of the form $y = \sin(x - C)$ and $y = \cos(x - C)$
Determine properties and sketch graphs of the form $y = A\sin(Bx - C)$ and $y = A\cos(Bx - C)$
Determine properties and sketch graphs of the form $y = A\sin(Bx - C) + D$ and $y = A\cos(Bx - C) + D$

Section 7.3 Graphs of Tangent, Cotangent, Cosecant, and Secant Functions (32)

Understand the graph of the tangent function and its properties

Determine properties and sketch graphs of the form $y = A\tan(Bx - C) + D$

Understand the graph of the cotangent function and its properties

Determine properties and sketch graphs of the form $y = A\cot(Bx - C) + D$

Understand the graphs of the cosecant and secant functions and their properties

Section 7.4 Inverse Trigonometric Functions I (35)

Understand and find the exact and approximate values of the inverse sine function

Understand and find the exact and approximate values of the inverse cosine function

Understand and find the exact and approximate values of the inverse tangent function

Section 7.5 Inverse Trigonometric Functions II (29)

Evaluate composite inverse trigonometric functions of the form $f\left(f^{-1}(x)\right)$ and $f^{-1}\left(f(x)\right)$

Evaluate composite inverse trigonometric functions of the form $f\left(g^{-1}(x)\right)$ and $f^{-1}\left(g(x)\right)$

Chapter 8: Trigonometric Identities, Formulas, and Equations

Section 8.1 Trigonometric Identities (33)

Review and use the fundamental identities

Verify trigonometric identities

Section 8.2 The Sum and Difference Formulas (35)

Use the sum and difference formulas for the cosine function

Use the sum and difference formulas for the sine function

Use the sum and difference formulas for the tangent function

Use sum and difference formulas to evaluate expressions involving inverse trig functions

Section 8.3 The Double-Angle and Half-Angle Formulas (42)

Use the double-angle formulas

Use the half-angle formulas

Use the double-angle and half-angle formulas to evaluate expressions involving inverse trig functions

Section 8.5 Trigonometric Equations (37)

Solve trigonometric equations that are linear in form

Solve trigonometric equations that are quadratic in form

Solve trigonometric equations using identities

Solve trigonometric equations using a calculator

Chapter 9: Applications of Trigonometry

Section 9.1 Right Triangle Applications (16)

Solve right triangles

Solve applied problems using right triangles

Section 9.2 The Law of Sines (26)

Determine if the Law of Sines can be used to solve an oblique triangle

Use the Law of Sines to solve the SAA case or the ASA case

Use the Law of Sines to solve the SSA (ambiguous) case

Use the Law of Sines to solve applied problems involving oblique triangles

Section 9.3 The Law of Cosines (22)

Determine whether Law of Sines or Cosines should be used to solve an oblique triangle
Use the Law of Cosines to solve the SAS case
Use the Law of Cosines to solve the SSS case
Use the Law of Cosines to solve applied problems involving oblique triangles

Section 9.4 Area of Triangles (19)

Determine the area of oblique triangles
Use Heron's Formula to determine the area of an SSS triangle
Solve applied problems involving the area of triangles

Chapter 10: Polar Equations, Complex Numbers, and Vectors

Section 10.1 Polar Coordinates and Equations (52)

Plot points using polar coordinates
Determine different representations of a point (r,θ)
Convert from polar to rectangular coordinates
Convert from rectangular to polar coordinates
Convert equations from rectangular to polar form
Convert equations from polar to rectangular form

Section 10.2 Graphs of Polar Equations (57)

Sketch equations of the form $r\cos\theta = a$, $r\sin\theta = a$, $ar\cos\theta + br\sin\theta = c$, and $\theta = a$
Sketch equations of the form $r = a$, $r = a\sin\theta$, and $r = a\cos\theta$
Sketch equations of the form $r = a + b\sin\theta$ and $r = a + b\cos\theta$
Sketch equations of the form $r = a\sin(n\theta)$ and $r = a\cos(n\theta)$

Chapter 12: Systems of Equations

Section 12.1 Systems of Linear Equations in Two Variables (16)

Solve systems of linear equations using the substitution method
Solve systems of linear equations using the elimination method
Solve systems of linear equations in two variables using either method
Solve applications using a system of linear equations