LSU Dual Enrollment Program for Math
Advanced Math Precalculus COURSE PROFILE 10-27-2026

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
9 – Applications of Trigonometry
10 – Polar Equations, Complex Numbers, and Vectors
12 – Systems of Equations and Inequalities

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 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 (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 midpoints or endpoints of line segments using the midpoint formula
Find the distance between two points using the distance formula

Section 2.2 Circles (31)

Complete the square to form perfect square trinomials
Solve nonlinear equations
Write the standard form of equations of circles
Write an equation of a circle
Write the standard form of equations of circles
Find the center, radius, and intercepts of circles given equations in standard form

Section 2.3 Lines (54)

Find the slopes of lines that pass through two given points
Sketch lines given a point and the slope
Find the point-slope form of a line
Find the slope-intercept form of a line
Find equations of lines that pass through two given points
Find slopes and y-intercepts of lines in standard form
Sketch graphs of equations
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 functions
Determine whether function are 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 a combination of horizontal and vertical shifts to graph functions
Use a combination of horizontal and vertical shifts to graph functions
Use a combination of reflections and shifts to graph functions
Use a combination of reflections, stretches/compressions, and shifts 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 if functions are inverses of each other
Find inverses of one-to-one functions
Sketch the graphs of inverse functions and determine their domains and ranges
Use the graph of functions 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 a quadratic function in vertex form and graph the function
Determine properties of a quadratic function by 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 The 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
Identify horizontal asymptotes
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

Section 5.2 Logarithmic Functions (55)

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

Section 5.3 Properties of Logarithms (36)

Expand logarithmic expressions
Condense logarithmic expressions
Use the logarithm property of equality to solve logarithmic equations
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
Solve logarithmic equations algebraically

Section 5.5 Applications of Exponential and Logarithmic Functions (19)

Solve applications involving compound interest
Solve applications involving exponential growth and decay

Chapter 6: An Introduction to Trigonometric Functions

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

Simplify and rewrite expressions containing π
Draw angles in standard position using degree measure
Draw angles in standard position using 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)

Convert between degree measure and radian measure
Determine the area of a sector of a circle
Compute the arc length of a sector of a circle

Section 6.4 Right Triangle Trigonometry (42)

Subtract fractions containing π
Evaluate trigonometric functions of an acute angle in a right triangle
Use the special right triangles to evaluate trigonometric expressions
Understand the fundamental trigonometric identities to evaluate trigonometric expressions
Find trigonometric cofunctions
Evaluate trigonometric functions

Section 6.5 Trigonometric Functions of General Angles (73)

Identify which of the four families of special angles a given angle belongs to
Find the six trigonometric functions of an angle given a point lying on its terminal side
Determine the quadrants where a trigonometric function is positive and negative
Find the values of the trigonometric functions of quadrantal angles
Find coterminal angles using radian measure
Find trigonometric function values given another function value
Determine reference angles
Evaluate trigonometric functions of angles belonging to the $\frac{\pi}{3}$, $\frac{\pi}{6}$, or $\frac{\pi}{4}$ families

Section 6.6 The Unit Circle (12)

Determine the missing coordinate of a point that lies on the graph of the unit circle
Find the values of the trigonometric functions given a point that lies on the graph of the unit circle
Use the unit circle to evaluate trigonometric functions at increments of $\frac{\pi}{2}$

Chapter 7: The Graphs of Trigonometric Functions

Section 7.1 Graphs of Sine and Cosine (36)

Identify properties of the sine function and find equivalent expressions
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 More on the Graphs of Sine and Cosine (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 The Graphs of the Tangent, Cotangent, Cosecant, and Secant Functions (32)

Graph and identify properties of the tangent function
Sketch graphs of the form $y = A\tan(Bx - C) + D$
Graph and identify properties of the cotangent function
Sketch graphs of the form $y = A\cot(Bx - C) + D$
Graph and identify properties of the cosecant and secant functions

Section 7.4 Inverse Trigonometric Functions I (35)

Find the exact and approximate values of the inverse sine function
Find the exact and approximate values of the inverse cosine function
Find the exact and approximate values of the inverse tangent function
Determine the interval or quadrant in which the angle of an inverse trigonometric function lies

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)

Find missing expressions in statements of trigonometric identities
Verify trigonometric identities

Section 8.2 The Sum and Difference Formulas (35)

Use the sum and difference formulas for the cosine function to evaluate trigonometric expressions
Use the sum and difference formulas for the sine function to evaluate trigonometric expressions
Use the sum and difference formulas for the tangent function to evaluate trigonometric expressions
Use sum and difference formulas to evaluate expressions with inverse trigonometric functions

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

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

Section 8.5 Trigonometric Equations (37)

Use special right triangles to evaluate trigonometric expressions

Determine the quadrants where a trigonometric function is positive and negative
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 applications involving 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 ASA case
Use the Law of Sines to solve the SSA case
Use the Law of Sines to solve applications involving oblique triangles

Section 9.3 The Law of Cosines (22)

Determine whether Law of Sines or the Law of 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 applications 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 applications involving the area of triangles

Chapter 10: Polar Equations, Complex Numbers, and Vectors

Section 10.1 Polar Coordinates and Equations (55)

Plot points using polar coordinates
Determine different representations of a point (r,θ)
Convert points from polar coordinates to rectangular coordinates
Convert points from rectangular coordinates to polar coordinates
Convert equations from rectangular form to polar form
Convert equations from polar form to rectangular form
Find the exact and approximate values of the inverse tangent function

Section 10.2 Graphs of Polar Equations (57)

Sketch equations of the form $\theta = a$, $r\cos\theta = a$, $r\sin\theta = a$, $ar\cos\theta + br\sin\theta = c$
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 $r = a\cos(n\theta)$
Identify types of graphs of polar equations

Chapter 12: Systems of Equations and Inequalities

Section 12.1 Systems of Linear Equations (16)

Solve systems of linear equations in two variables using the substitution method
Solve systems of linear equations in two variables using the elimination method
Solve systems of linear equations in two variables using either substitution or elimination
Solve applications involving systems of linear equations