

PRECALCULUS COURSE OUTLINE

First Quarter

Chapter 1 Functions & Linear Relations (6 days)

Interval notation, domain, range, testing points, function operations, composition of functions, inverse functions, linear equations

Chapter 1 Test

Chapter 3 The Nature of Graphs (5 days)

Families of graphs, stretching, shrinking, and shifting graphs, symmetry, even & odd functions, piecewise functions, graphs of inverse functions, graphs of rational functions and asymptotes, graphs of inequalities

Chapter 3 Test

Chapter 4 Polynomial & Rational Functions (5 days)

Finding roots of quadratics & polynomials, solving rational equations and inequalities, breaking rational functions into partial fractions, factoring & simplifying complicated expressions, solving radical equations

Chapter 4 Test

Chapter 11 Exponential and Logarithmic Functions (5 days)

Simplifying negative & rational exponents, operations with e and $\ln x$, graphing exponential and logarithmic functions, properties of logarithms, solving exponential and logarithmic equations, curve fitting with TI-84 regression

Chapter 11 Test

Portfolio Due

Second Quarter

Chapter 15 Statistics (6 days)

Frequency distributions, histograms, stem-and-leaf plots, box-and-whisker plots, measures of central tendency, measures of variation, the normal distribution, sampling methods, abuses of statistics, scatter plots and curve fitting, confidence intervals

Out-of-class project: Sampling & Analyzing Statistical Data

Chapter 15 Test

Chapter 14 Combinatorics & Probability (6 days)

Permutations, combinations, probability and odds, independent & dependent events, mutually exclusive & inclusive events, conditional probability, binomial probability, expected value, Monte Carlo methods using the TI-84

Chapter 14 Test

SEMESTER 1 TEST

Chapter 16 Graph Theory (8 days)

Graph theory terminology, Euler paths & circuits, Hamilton paths & circuits, shortest paths and minimal distances, spanning trees, directed graphs and matrices, map coloring and coloring vertices

Out-of-class project: Mathematical version of "Twas The Night Before Christmas"

In-class project: Modeling with Graph Theory

Chapter 16 Test

Portfolio Due

Third Quarter–Trigonometry

Start HyperStudio Projects

Chapters 1, 2, & 3 The Trig Functions, Solving Triangles & Radian Measure (6 days)

Coterminal angles, similar triangles, definitions of the trigonometric functions, importance of quadrants, using the definitions of the trig functions, degree vs. radian measure, special angle values using degrees and radians, arc length, linear & angular velocity, solving right triangles

Complete special angle flash cards using degrees

Chapter 1, 2, & 3 Test

Chapter 4 Graphs of Trig Functions (5 days)

Analyze graphs of all six trig functions using amplitude, period, phase shift & vertical shift, write equations of give graphs, applications of trig graphs

Complete special angle flash cards using radians

Chapter 4 Test

Chapter 5 Trig Identities (6 days)

Algebraic operations with trig functions, verify identities using the fundamental identities, sum & difference identities, double angle identities, and half angle identities

Chapter 5 Test

Chapter 6 Inverse Trig Functions and Trig Equations (6 days)

Limited quadrants of inverse trig functions, using inverse trig functions, solving trig equations using algebraic methods and trig identities, solving inverse trig equations

Chapter 6 Test

Portfolio Due

Fourth Quarter

Chapter 8 Complex Numbers (2 1/3 days)

Polar coordinates, polar form of complex numbers, operations in polar form

Chapter 8 Quest

Partner Projects Due

Chapter 7/8 Solving Oblique Triangles & Applications with Vectors (7 2/3 days)

Law of Sines, Law of Cosines, vectors operations, applications of vectors to real world situations, parametric equations

Video: Applications of Trigonometry

In-class project: Airplane Navigation Investigation

Chapter 7/8 Test

SEMESTER 2 TEST

Chapter 17 Introduction to Calculus (6 days)

Introduce the fundamental concepts of calculus—limits, derivatives, and integrals

Chapter 17 Test

Portfolio Due

Chaos & Fractals

Fractal geometry of the Mandelbrot Set, chaos theory, and the applications of each

Video: The Fractal Geometry of the Mandelbrot Set

Chaos & Fractals Test