

Number

Defining Mathematics

History of Number

Permutations and Combinations

Operations with whole number exponents

Operations with fractional exponents

Operations with scientific notation

Logarithm means exponent

Subsets of Real Numbers

Set notation

Complex numbers

Operations with complex numbers

Absolute value

Counting problems, including permutations and combinations

Special number types, including binary

Ratio (including proportional relationships)

Rational and irrational numbers

Rational and radical equations

Logarithms as "ratio numbers"

Direct and inverse variation

Product rule for logarithms

Quotient rule for logarithms

Power rule for logarithms

Proportion and the Christian adventure

Rate and Ratio word problems

Simplifying complex fractions

Similarity and scaling

Algebra (including algebra of functions)

History of Algebra

Algebra fundamentals review

Combined operations with logarithms

Quadratic formula

Finding domain and range from functions

Operations with functions

Symbolic transformations of functions

Evaluating functions

Composite functions

Operations with polynomials

Operations with exponents

Operations with logarithms

Linear equations

Quadratic equations

Absolute Value equations

Polynomial equations

Polynomial division

Synthetic division and the remainder theorem

Synthetic division and the factor theorem

Rational equations

Radical equations

Exponential equations

Logarithmic equations

Linear systems of equations x

Non-linear systems of equations

Word problems and systems of equations(value, uniform motion, etc.)

Partial fractions

Geometry (Including Logic)

History of Geometry

Geometry Fundamentals Review

Geometry in 3D design

Euclid, axioms and postulates

Euclid, theorems, proofs

Triangle similarity

Triangle congruency

Triangle proofs

Circle relationships

Non-Euclidean Geometry

Pythagorean theorem

Logic fundamentals

Syllogisms

Analytical Geometry (including graphical forms of functions)

History of Analytical Geometry

Analytical geometry fundamentals review

Linear equations

Functions and relations

Modeling functions review

Finding domain and range from graphs

Finding x-intercepts (roots) of polynomial functions (equations), with and without a graphing calculator

Finding extrema from graphs (with and without graphing calculator)

Finding inverse functions

Graphing functions

Complex roots

Conics, including parabolas, circles, ellipses and hyperbolas

Locus definitions for conics

Even and odd functions

Finding poles and zeros

Inverse functions

Graphical representation of functions, including linear, nonlinear, and piecewise defined

Graphical transformation of functions, including linear, nonlinear, and piecewise defined

Linear system word problems (graphical forms)

Nonlinear system word problems, with and without graphing calculator

Exponential growth and decay word problems

Measurement

History of measurement

Why standards matter

Rate conversions

Length conversions

Area conversions

Volume conversions

Currency (money) conversions

Special conversions, like finding cost per part

Evaluating scientific formulas, including gas laws

Interest rate, savings, and debt, and what the Bible has to say about it

Trigonometry

Trigonometry and right triangle basics

Trigonometry and Unit Circle Basics

Inverse trig functions

Reciprocal trig functions

Composite trig functions

Products of complex numbers

DeMoivre's theorem, Euler's formula, and complex roots

Parallelogram law

Polar coordinates and conversion to rectangular, and vice-versa

Vectors

Resultant vectors

Resultant vectors, force applications

Trigonometric equations

Graphing Trig functions

Transformations of Trig functions

Basic Trig. Identities

Sum and Difference Trig. Identities

Half and Double angle Trig Identities

Periodicity

Trig functions as models

Using Trig to find area of inscribed regular polygons and connection to finding integrals

Calculus

History of Calculus

Calculus and the Trinity

To understand calculus, just believe

Limits of simple continuous and discontinuous functions

Limits that use operations with functions like $f(x)$ and $g(x)$

Limits of rational polynomial functions

Infinity as a limit

Special limits

Limits with special properties, like $|x|/x$, $(\sin x)/x$, $\sin(1/x)$, etc.

Limit definitions of fundamental derivatives

Limit definition of an integral

Calculus is about rates of change

Particle velocity and acceleration

Average and instantaneous rates

Derivative means slope

Slope at a point

Derivatives of polynomials

Derivatives of more types of elementary functions

Using derivatives to find equations of tangent lines

Derivative applications, including finding extrema

Differentiability

Higher order derivatives, like 2nd, 3rd, etc.

Derivatives of sums and differences

Product and quotient rules for derivatives, with proofs

Differentials

Implicit differentiation

Chain Rule for derivatives, including use with composite functions
Related rates
Critical numbers(including the critical number theorem)
Critical number applications
First derivative test
2nd derivative test
Functions of f , f' , and f''
Mean Value Theorem for derivatives
L'Hopital's Rule
Extreme value problems
Derivatives of inverse functions
Linear approximation
Newton's method
Integrals and estimating area by counting squares
Integrals and estimating area using upper rectangles
Integrals and antiderivatives
The indefinite integral
Integration by u-substitution
Rolle's Theorem
Antiderivatives and position functions
Antiderivatives and growth and decay
Integration by parts
Using trig identities to simplify integrals
Riemann sums
Definite integrals as sums of infinite series
Fundamental theorem of calculus
Definite integrals and the fundamental theorem of calculus (basic forms)
Definite integrals of sums and differences
Integration by change of variable
Integral of a derivative
Derivative of an integral
Solids of revolution, including disk method, shell method, and washer method

Interval properties of definite integrals

Discontinuous, but integrable functions

Mean value theorem for integrals

Bounded areas

Area and solving integrals

Separable differential equations

Differential equations and slope fields

Statistics

One-variable data and the normal distribution, histograms

Mean, median, mode and range

Standard deviation

Linear and nonlinear regressions

Computer Mathematics

Sequences

Series

Infinite Series

Resolving fractions into infinite series

Deriving formulas for infinite series

Sums

Partial sums of infinite series

Converging and diverging infinite series

Absolute convergence

Conditional convergence

Alternating series test

Comparison test for absolute convergence

Other tests for convergence(integral test, limit comparison test, ratio test, root test)

p-Series applications

Power series

Pascal's triangle

Binomial Theorem

Recurrence problems