

MATH LAB TUTOR APPLICATION TEST REVIEW SHEET

(Lower Division)

We don't expect you to have a complete or perfect understanding of all the concepts listed below. A basic understanding of each principle will suffice.

Algebra and Trigonometry

- Basic trig identities
- Unit circle (evaluating trig functions for a given angle)
- Finding the domain and range of a function
- Factoring
- Solving for roots / zeros of functions
- Complex numbers (i)
- Basic graphs
 - Linear equations (lines)
 - Quadratic functions
 - Logarithmic functions
 - Exponential functions
 - Trigonometric graphs
- Finding the inverse of a function
- Logarithmic and exponential functions
- Inequalities
- Systems of equations
- One-to-one functions
- Basic probability
- Polynomial long division
- Completing the square
- Series and sequences
 - Calculating the n^{th} term
 - Calculating the sum of the first n terms
 - Arithmetic, geometric, and recursive

Calculus and Analysis

- Definition of a limit
- Definition of a derivative (in terms of a limit)
- Differentiating and integrating basic functions:
 - Trig functions
 - Polynomials
 - Logarithms
 - exponentials
- Special rules for derivatives:
 - Implicit differentiation
 - The chain rule
 - Product rule, quotient rule, etc.
- Related rates [in word problems]
- Optimization (finding the max. or min.)
- Calculating the volume of rotated regions (using Shell or Disk integrating techniques)
- Calculating surface area of rotated curves
- Calculating the length of a curve (of Cartesian or Parametric equations)
- Finding the area between two curves
- Integration techniques:
 - U-substitution
 - Integration by parts
 - Trigonometric substitution
 - Partial fraction decomposition
- Different coordinate systems:
 - Cartesian
 - Parametric
 - Polar
- Series
 - Definitions of convergence and divergence
 - Different tests for convergence or divergence
 - Taylor series
 - Power series
- Calculating work or fluid density

There is a sheet containing various trigonometric functions, formulas, etc, and another sheet containing common derivatives and integrals. Both can be found at <https://math.byu.edu/home/mathlab> under "Handouts & Practice Exams".