

# TA Application Test Review Sheet

## (Upper Division)

Every week the TAs are trained to solve the upcoming week's problems, so it isn't imperative that you be perfect at everything below, but you should feel that with a little refreshing you could pick up the following easily. Any of these topics are fair game for the test, though: (bolded topics you should have down cold)

### Math 313—Linear Algebra:

- Gauss-Jordan Elimination
- Matrix Operations
- Properties of Determinants
- Inverse of a matrix
- Linear Independence
- Vector Spaces, Subspaces
- Column Space, Nullspace
- Wronskian
- Inner Products
- Orthogonality/ Orthonormality
- Least Squares
- Gram-Schmidt Process
- Eigenvalues/Eigenvectors
- Diagonalization
- Linear Transformations
- Range and Kernel
- Similarity
- Change of Basis

### Math 314—Multivar. Calculus:

- Dot product, cross product
- Equations of 3D figures
- Space curves
- Curvature
- Arc Length
- Triple Integrals
- Spherical and Cylindrical Coordinates
- Level curves, contour Lines
- Limits in several variables
- Partial Derivatives
- Chain Rule
- Directional Derivatives
- Gradient

### Math 314—Multivar. Calculus:

- Max/Min/Saddle Points
- Lagrange Multipliers
- Vector Fields
- Parameterization
- Line Integrals
- Surface Integrals
- Green's Theorem
- Stokes Theorem
- Divergence Theorem

### Math 334—Differential Equations:

- Direction Fields
- Order, Linearity
- Separable Equations
- 1<sup>st</sup> Order Linear Equations
- Exact Equations
- Autonomous Equations
- Homogeneous ODEs w/ constant coefficients
- Reduction of Order
- Undetermined coefficients
- Variation of Parameters
- Mechanical Vibrations
- Series Solutions
- Regular/Singular Points
- Euler Equations
- Laplace Transform
- Delta Function, Convolution
- Systems of Differential Eqs.

**BYU**  
*Math Lab*