If I were studying for this exam, I would begin by looking at:
old exams, projects, quizzes, and notes.

(Basic Computational) Things you should know...

- How to solve a linear system (of equations).
- How to use Gauss-Jordan elimination to find RREF of a matrix.
  [Also, what do REF and RREF mean?]
- How to multiply matrices.
- How to find the inverse of a matrix.
- How to find a determinant – expanding along rows/columns.
- How to find eigenvalues/eigenvectors for a matrix.
- How to use the Gram-Schmidt process.

Other stuff you should know...

- $\det(AB) = \det(A)\det(B)$, $\det(A^{-1}) = \det(A)^{-1}$, for A $n \times n$: $\det(cA) = c^n\det(A)$, etc.
- What is an elementary matrix/operation? What do these do to matrices/determinants?
- How is "Span(S)" defined?
- What is a vector space? Subspace?
- What is linear independence/dependence?
- What is a basis? Dimension? Isomorphism?
- What are the coordinates of a vector relative to a basis? Change of basis?
- Vector spaces are isomorphic if and only if their dimensions match.
- What is the column/row/null space of a matrix? How do I find bases for these spaces?
- rank = # of pivots = # of non-zero rows in RREF = # of basic variables in corresponding homogeneous system = dimension of column space
- nullity = # of non-pivot columns = # of free variables in correspond homogeneous system = dimension of null space
- rank + nullity = dimension of the domain
  ...OR...*MATRIX VERSION*
  rank + nullity = # of columns
- What is a linear transformation?
- Kernel? Range?
- How do I find the matrix of a linear transformation relative to some bases?

- How do I find bases for the kernel and range of a linear transformation?
- What is an eigenvalue/eigenvector/eigenspace? Algebraic/geometric multiplicities?
- What is a characteristic polynomial? How is this related to eigenvalues/determinant?
- What does "diagonalizable" mean? Possible? How do I do it?
- What is an inner product/norm/distance function?
- Angle between two vectors? Cauchy-Schwatz/Triangle inequalities? Pythagorean theorem?
- What does orthogonal/orthonormal mean?
- Non-zero + orthogonal $\implies$ linearly independent
- $\{v_1, \ldots, v_\ell\}$ an orthonormal basis $\implies w = \langle v_1, w\rangle v_1 + \cdots + \langle v_\ell, w\rangle v_\ell$
- What is a projection?
- Orthongonal complement? How do I find a basis?

Some Selected Textbook Review problems

- Chapter 1 Review (pages 40-41): 3-6, 15, 23, 25, 35, 38
- Chapter 2 Review (pages 114-115): 5-15(odd), 19, 23, 25, 33
- Chapter 3 Review (pages 166-167): 11, 18, 21, 37, 43, 45
- Chapter 4 Review (pages 265-267): 7, 11-25, 33, 45, 56
- Chapter 5 Review (pages 343-344): 1-7(odd), 11, 21, 23, 27, 43-45
- Chapter 6 Review (pages 405-406): 3-9, 14, 19-31(odd), 39, 46, 49, 51
- Chapter 7 Review (pages 461-462): 1-9(odd), 13, 39(a)

There's a lot that these problems don't cover...I will try to address some of these things when we review.