ORAL FINAL EXAM REVIEW

Theorems & Results You Have to Know

(1) The 3 Isomorphism Theorems
(2) The universal property of the quotient (explain how to construct the map from the quotient and why it gives a bijection between the relevant sets)
(3) The universal property of the tensor product (explain how to construct maps from the tensor product and why it gives an identification with bilinear maps)
(4) Riesz representation theorem for a non-degenerate bilinear form
(5) The theorem about cyclic subspaces for nilpotent spaces (the one that requires the top non-zero powers of a linear operator on the set be linearly independent).
(6) Choice of a basis gives an isomorphism with a free vector space. Choice of an orthonormal basis gives an isomorphism with $\mathbb{R}^n$ or $\mathbb{C}^n$ with the dot product.
(7) The dual of a short exact sequence is short exact

Things You Must Be Able to Compute

(1) Jordan form and Jordan basis
(2) Gram-Schmidt orthogonalization
(3) The value of the exterior powers of a linear operator on various elements

That's it!