

ALGEBRA QUAL PREP: LINEAR ALGEBRA

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There are basically two linear algebra topics that come up on the quals: canonical forms of matrices, and bilinear forms.

1. CANONICAL FORMS FOR MATRICES

Exercise 1.1. Review Jordan canonical form, if necessary, and read about rational canonical form.

Qual problems on canonical forms. Please attempt the following questions. Write up at least one question on each of Jordan and rational canonical form, and turn it in to me.

- (1) 2014 Fall, Afternoon # 4
- (2) 2010 Spring, Morning # 2
- (3) 2011 Spring, Afternoon # 1
- (4) 2012 Spring Afternoon # 7
- (5) 2014 Spring Afternoon # 5

2. BILINEAR FORMS

There is a question on multilinear algebra almost every year. They usually show up as # 5 and can take look intimidating, but with a little practice they should be the most straightforward question on the exam.

Qual problems on bilinear forms. Please attempt the following questions. Write up at least one question and turn it in to me.

- (1) 2010 Fall, Afternoon # 5
- (2) 2012 Fall, Morning # 5
- (3) 2013 Spring, Morning # 5
- (4) 2014 Spring, Morning # 5