

CSCI-GA.2420-001/MATH-GA.2010-001
Numerical Methods I Fall 2013
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Homework set 6: Due Friday November 22 at 12 noon.

Homework should be given to me in class or put under my office door.
Do not put it in my mail box.

In all cases, discuss your findings.

1. Consider cubic spline interpolation of periodic functions and assume that we also wish the spline to be periodic with the same period. Consider the case when we have equidistant knots. Show that such a periodic spline exists and is unique and that the cost of computing it is linear in the number of knots, just as in the case covered in the October 31 lecture.
2. Let A be a square real matrix and consider its Schur normal form Q^*TQ where Q is unitary and T an upper triangular matrix. Prove that there is a similar factorization of A with T real but not quite upper triangular; we allow two-by-two as well as one-by-one matrices on the "diagonal" of T .
3. Problem 27.5 in Trefethen-Bau.
4. Problem 28.1 in Trefethen-Bau.
5. Problem 28.2 in Trefethen-Bau.
6. Problem 30.5 in Trefethen-Bau.
7. Problem 30.6 in Trefethen-Bau.