Math 115A: Problem set 8

Sections 1 and 3. Instructor: James Freitag

Due 12/4

Problem 1 Complements of complements

Let V be a finite-dimensional inner product space. Let W be a subspace of V. Show that $(W^\perp)^\perp = W$.

Problem 2 Find a basis

Find an orthonormal basis of $P_2(\mathbb{R})$ such that differentiation is an upper triangular matrix with respect to this basis.

Problem 3 Find a basis

Find a polynomial $q \in P_2(\mathbb{R})$ such that

$$p\left(\frac{1}{2}\right) = \int_0^1 p(x)q(x)dx$$

for all $p \in P_2(\mathbb{R})$.

Problem 4 Exercises from the book

Do the following exercises from book:

- 5 from section 6.2..
- 11 from section 6.3.
- 7 from section 6.4.