

Homework 8

Math 330

Type (in \LaTeX) your solutions to the following problems. Submit them either on Moodle or in the homework mailbox (RMS level 3, near the fireplace) by 4:00pm on **Thursday, November 7**.

1. Problem 5.3.3
2. Problem 5.3.5
3. Problem 5.3.9 — *Hint*: “equidimensional” means this is a Cauchy-Euler equation (see page 74), so we should look for solutions of the form $\phi(x) = x^r$. Also, don’t forget about Euler’s formula.
4. Problem 5.4.1 — For this problem, you don’t have to explicitly find the eigenvalues or eigenfunctions. Your answers can be in terms of λ_n and ϕ_n .
5. Problem 5.5.1(ac)
6. Problem 5.5.8 — *Hint*: For part (a), try differentiating $\pm uv''' \pm u'v'' \pm u''v' \pm u'''v$.