Math 453 − Homework 4

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Friday, March 3, 2017

This assignment is due on **Friday, March 3, at 10:50 AM**.

Reading: Sections 2.2.3 and 2.2.5. In 2.2.3(c), we'll only do the case $k = 1$, and we'll skip 2.2.3(e) and 2.2.4 altogether.

Chapter 2: 4, 5, 6

Hint for 4: Use the fact that if a function v attains its maximum at an interior point x, then $\Delta v(x) \leq 0$. I'll try to talk a bit about that during lecture.

Hint for 5c: Convex means that $\phi''(x) \geq 0$

Hint for 6: First of all, remember that you have to prove the assertion given in the hint. Also, notice that the hint only shows that the proposition is true for u, not $|u|$. To show that the proposition is true with $|u|$, let $v = -u$, and notice that v satisfies $-\Delta v = -f$ in U and $v = -g$ on ∂U, so you can use the result that you've shown but with v instead of u, $-f$ instead of f, and $-g$ instead of g.