Math 5433 — Review for Exam 1

The first exam will cover the following sections from the text: 5.5, all of chapter 6, and 7.1 and 7.2.

In section 5.5, you can skip the Schwarz-Pick theorem. (I say this with a little regret, because it turns out there are some very beautiful developments which arise from the Schwarz-Pick theorem and its generalizations — you can read about them in an article in the AMS Notices titled "From Schwarz to Pick to Ahlfors and Beyond", by Robert Osserman. In particular you can use Ahlfors' generalization of the Schwarz-Pick theorem to prove Bloch's theorem, which in turn you can use to give a short proof of Picard's Little Theorem, which we will prove later in the course using a different and lengthier argument. I have a link to the AMS Notices article on the course web page.)

I followed sections 6.1 to 6.4 closely in the lecture notes, with a few relatively minor differences here and there. You'll notice that my treatment of Montel's theorem was fairly different than the one in the text, though. Also, I did go through a proof of the Arzela-Ascoli theorem. It would probably be worth your time to take a few minutes to verify that both the text and I did the same thing, in slightly different ways.

For section 6.7, the main difference between the lectures and the text is that I skipped the first proof that the text gives of statement **(3)**, that any maximizer of $|f'(P)|$ in $\mathcal{F}$ must be onto, and only gave the second proof. You might prefer the first proof. It's a matter of taste.

In sections 7.1 and 7.2, I again followed the text closely.

There's a shortage of practice problems in our text on the material covered in these sections. We've done most of the relevant ones already on the homework assignments. You might find some interesting problems in other standard complex analysis texts, or online. I'll look around for some myself in the next couple of days.