The first exam will be Tuesday, February 28; it will cover all our work on complex variables through Tuesday, February 21. Here is some guidance on the secton in the book which we have covered:

- Chapter 21, all sections.
- Chapter 22, Sections 1–3.
- Chapter 23, Sections 1–3, 5.
- Chapter 24, Section 2.2, parts of Section 3 and 4, Section 5.
  - Section 2.1 is review; we have not covered it specifically, but take a quick look.
  - There is a lot in Sections 3 and 4 that we have not covered; I would suggest concentrating on class lecture notes for that material.

Turn in starred problems Tuesday 2/21/2017. We will not cover Section 24.5 until Tuesday 2/21, so no problems on that section will be collected.

Section 23.5: 1. (a), (d), (e), 4 (a)*, (b).

Section 24.2: 6 (c), (d)*, (f), 8 (a), (d); 9*; 11 (e), (f), (j); 16 (g). See instruction below for 6(d).

Section 24.3: 4 (d), (e)*

Section 24.4: 2 (a), (c), (d), (f), 3 (b)*, (c).

Section 24.5: 1. (a), 2 (b), (c), (h), (j), 3 (f), (i), 4, 6 (a), (e), 7.

5.A* Obtain the Taylor series of $f(z) = \dfrac{1}{5-z}$ with center $z = 2$. Hint: do not use formula (15); rather, obtain the desired series from the usual geometric series $\sum_{k=0}^{\infty} z^k = 1/(1-z)$.

5.B* Let $f(z) = (z^4 - z^2)^3 \tan^2(\pi z/2)$.

(a) Find all singular points of this function and for each, if it is isolated, classify it as removable or a pole of specified order.

(b) Find all zeros of this function, after any removable singularites have been removed, and the order of each.

Instructions, hints, remarks, etc. 1. In 24.2.6(d), also identify explicitly the function which is the sum of the series.

2. Problem 24.4.3 mentions essential singularities, which we have not studied, but they don't occur in the assigned problems.

3. For 24.4(f), note that the Taylor series of e^z around any point a is easily obtained by $e^z = e^a e^{z-a} = e^a \sum_n \dfrac{(z-a)^n}{n!}$.