Use the following list of questions as a guide in your review of material of Math 165B:

• The exam is on Thursday, 06/14, 3:00 pm – 6:00 pm.
• In the exam, you have to show every step of your calculation.
• A cheating will cause a serious consequence even for your whole life.

(1) What is a holomorphic function, a differentiable function? What does Goursat Theorem say?
(2) What is an analytic function? What is the relation between an analytic function and holomorphic function?
(3) What is the Taylor series? What is the convergence radius of a power series?
(4) What is a meromorphic function?
(5) What is the Laurent series? What are the coefficients of Laurent series?
(6) What is an isolated singularity?
(7) What is a removable singular point? What is a pole? What is an essential singular point?
(8) What is the residue of a holomorphic function at an isolated singular point?
(9) What is harmonic function? What is the Poisson integral formula?
(10) What the Dirichlet problem on the unite disk?
(11) What is the conjugated harmonic function of a given harmonic function?
(12) What is a linear fractional transformation?
(13) What is the Riemann sphere and what is the cross ratio of four distinct points in the Riemann sphere?
(14) What is the relations between a zero and a pole?
(15) What is the residue at the infinite point?
(16) What is the fundamental Theorem of Algebra? What is the multiplicity of zeros and poles?
(17) What is the argument principle?
(18) What is the Rouche’s Theorem?
(19) How do you integrate an improper integral?
(20) How do you integrate an improper integral with log?
(21) How do you integrate an improper integral with a dent?
(22) How do you integrate an improper integral with a branch cut?
(23) What is a conformal map?
(24) How do you integrate a definite integral with sines and cosines?
(25) How do you estimate the numbers of zeros of a polynomial inside a simple close curve?

Review Problems:

\[62\]: 3, 4. \[66\]: 1, 4. \[71\]: 1, 2. \[72\]: 1. \[74\]: 3, 4. \[76\]: 1. \[79\]: 3, 7. \[81\]: 8. \[84\]: 1, 2, 4, 7. \[85\]: 5. \[87\]: 1, 6. \[90\]: 6. \[94\]: 1, 5, 6. \[95\]: 6. \[97\]: 7. \[98\]: 5. \[103\]: 1, 7, 8. \[106\]: 1, 3, 5. \[124\]: 3, 6, 7.