

REVIEW FOR QUIZ 1

The following is a brief review of the topics discussed in lecture since the previous quiz, presented in the form of questions. The quiz will focus on things covered in lecture and lab.

- What are the principles behind the methodology in weather forecasting?
- What is meant by representativeness in observations?
- What is meant by direct vs remote, active vs passive, surface vs upper-air observations?
- What are the fundamental physical principles (i.e., laws of radiation) on which passive satellite instruments operate? How does one get cloud top temperature or a vertical temperature profile from satellite or assess upper level flow?
- What are the advantages and disadvantages of the polar vs geostationary orbits for meteorological applications?
- What are the terms of the equation of motion and under what conditions each is important?
- What is the purpose of scale analysis? What did the scale analysis tell us about large-scale wind systems? What are the primary forces operating on the macroscale (synoptic scale) in the atmosphere?
- How do geostrophic balance, gradient wind balance, and cyclostrophic balance differ? When and where would each of these be operating in the atmosphere?
- What is the equation that you would use and what information is needed to calculate V_g ?
- How does friction effect flow in the boundary layer? In this regard, what is the significance of straight vs curved isobars? What is the impact of changes in surface roughness?
- How was a dispersion relationship for Rossby waves derived, what assumptions were made?
- How does one diagnose the location and propagation of Rossby waves, Rossby wave trains, and high-impact synoptic-scale storms? What is the time scale for each? (Hint: Hovmoller diagrams).
- What is meant by retrogression, progression?
- Derive a formula for thermal wind in isobaric coordinates.

P.S. Expect to turn in the 500 mb Ht and T analysis.