Theory Points Examined in the Sample and Real Midterm I.

Sample Midterm:

1. Simulation can be used to test hypotheses.
   Simulation can produce information of value.
2. Normal distribution shape is easily related to mean & SD.
3. Short term forecasting of noisy time series just uses recent terms.
4. Rare events suggest re-examination of premise.
5. Nuisance variables can blur info from variables of interest.
6. Sample averages vary less than the numbers averaged.
7. Inference from a table of numbers can depend on the context of the numbers.
8. Apparent trends are useless for prediction.

Midterm:

1. A (symmetric) random walk has apparent trends that a naïve person would think had predictive value. The market is assumed to be similarly predictable by naïve advisors and their clients.
2. All models are wrong but some are useful for comparison.
3. see 5 above.
4. The context of the data and the common sense of the investigator are what determine the amount of smoothing of the data.
5. When analyzing a huge data set, almost everything is significant, so practical importance is a bigger issue than "real" difference.
6. When a variable has a positive long-term mean, then a random sample of values of this variable will tend to be positive and have a smaller SD than the variable itself.
7. True experiments have the feature that the investigator forms the comparison groups using a random mechanism, and this induces the comparision groups to be balanced with respect to all characteristics, so the group identifier can be inferred as a cause, and not only a correlate.
8. The Central limit theorem says that sample means will vary from their population means by $SD/\sqrt{n}$, where SD is the population SD.