

Name: _____

Spring 2005

First Year Seminar

Midterm

There are a total of five questions on this exam. Note that on questions four and five, you have your choice of essays. This is a timed exam; you will have 120 minutes for the whole exam.

- [20 points]** George Washington and Abraham Lincoln were both born in February. Maybe this is the month when presidents are born!
 - [4]** (Answer) Assuming no particular part of the year is favored over any other, what is the probability that a person would be born in February?
 - [8]** (Calculation) There have been 42 presidents up to and including George W. Bush. How many presidents would you expect to be born in February, and what is the standard deviation on this number?
 - [8]** (Calculation, and short answer) The actual number of presidents born in February is 4. Calculate a z -value for this number, and tell me if you think this is a remarkably high number.

Name	Attempt	Success	\hat{p}	$\hat{\sigma}_p$
Chris Paul	161	133		
Eric Williams	180	105		
Justin Gray	151	82		

- [20 points]** At right is a table showing the number of times three players have attempted free throws this season, and the number of times they succeeded. Pick any two of the three players.
 - [12]** (Calculation) For the two players you picked, calculate the best estimate \hat{p} of the probability of them making free throws and the uncertainty $\hat{\sigma}_p$ (standard deviation) of this number.
You may write your answer directly on this test, if you wish.
 - [8]** (Calculation, and short answer) Compare the two players you have chosen. How confident are you that one of them is better than the other (at free throws)?
- [20 points]** (Medium Essay – 2 or 3 paragraphs) A new drug, in the form of little pink pills, has been developed which improves performance on Dr. Carlson's midterms. You have been hired by Acme Pharmaceuticals to test this drug. Design an experiment to test the claim that these pills actually *do* improve performance on Dr. Carlson's midterms. Explain *why* you want to do the tests in the way you do.

Note that for each of the following questions, you need only choose one of two essays.

4. **[20 points]** (Medium Essays – about 2 paragraphs) Choose one of the following two topics and write a short essay about it.
- (a) Explain how optical illusions and difficulties in judging size and distance can contribute to UFO reports.
 - (b) Explain what “source confabulation” also called “source confusion” is and how it can contribute to details in UFO encounters and/or alien abductions.
5. **[20 points]** (Medium Essay – 2 or 3 paragraphs) Write an essay on one of the following two topics.
- (a) A friend of yours tells a story of how they were visited by a ghost while they were sleeping. “I wasn’t dreaming, it was very real!” They awoke in the middle of the night and saw an unearthly light. They were so terrified they couldn’t move. Suddenly their (deceased) grandmother appeared. As grandma passed near them, the person felt like a cold wind had blown through their body. They were frozen in place, literally so terrified they couldn’t move. As grandma passed by, it felt like they were suffocating. Grandma passed through the walls and disappeared. They then went back to sleep. Give an alternative explanation besides the supernatural one for this incident.
 - (b) The great psychic Cire Noslrac, on the TV show “Bridge to the Dead,” chooses an audience member. The psychic’s comments are in *italics* below.
 - “*Someone close to you passed away recently, didn’t they?*”
 - “Yes, my Mother did.”
 - “*The name – it starts with an N?*”
 - “No – oh you mean my Aunt Nancy. She died a few years ago.”
 - “*Yes, Nancy. She was older, wasn’t she? And the cause, it was something here?*” Holding hands to his chest, “*or here?*” indicating his head.
 - “Yes – she had a stroke.”
 - “*She has something she wants to say to you. She says you have love in your heart. You have to not be afraid to share it.*”
 - “What? What does that mean?”
 - “*You have to stop being afraid of commitment.*”
 - “You mean, she wants me to get married to my boyfriend?”
 - “*Yes, she says, it’s that time.*”
 - “How did you know he asked me to marry him?”
 - “*The Dead know all.*”
- Give one or more possible non-supernatural explanation of how the psychic was able to predict that this person’s mother and aunt passed away, the aunt’s name and cause of death, and the fact that the audience member had received a marriage proposal.