

Homework 7

S320/520

Upload your answers as a PDF file or Word document through the Assignments tab on Canvas by 4pm, Thursday 22nd October.

Please write “S320” or “S520” at the top of your homework. Trosset question numbers refer to the hardcover textbook. Include R code as an appendix to your answers.

1. Trosset exercise 9.6.6
2. Trosset exercise 9.6.9
3. Trosset exercise 9.6.11. Note: As per the book errata, use $L = 0.001$.
4. A person wishes to show beyond reasonable doubt that he has psychic powers. He takes the test described in Trosset exercise 4.5.14, except he tries to identify 100 symbols, with a 20% chance of being right for each symbol if he does not have psychic powers. The result is that he correctly identifies 25 out of 100 symbols.
 - (a) Write down appropriate null and alternative hypotheses for this test.
 - (b) For someone without psychic powers, what is the probability of correctly identifying 25 or more symbols out of 100? (Use the binomial.)
 - (c) Has the psychic demonstrated his powers beyond reasonable doubt?
5. In a recent Gallup poll, 55% of a sample of 1028 U.S. adults supported same-sex marriage.
 - (a) Treating the data as a simple random sample, find a 95% confidence interval for the percentage of all U.S. adults who support same-sex marriage.
 - (b) (1 point of extra credit.) In fact, Gallup stated a 4 percentage point margin of error at the 95% confidence level, implying a confidence interval of 51% to 59%. Why does this differ from your result?