

Homework 7

S520

Upload your answers as a PDF or HTML through the Assignments tab on Canvas by 4pm, Thursday 10th March.

Trosset question numbers refer to the hardcover textbook. Draw all graphs in R and include all R code. You may work with others, but you must write up your homework independently — you should not have whole sentences in common with other students or other sources.

1. Trosset exercise 9.6.6
2. Trosset exercise 9.6.7
3. Trosset exercise 9.6.8
4. Trosset exercise 9.6.9
5. 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) Suppose a person does not have psychic powers. Using the binomial or otherwise, find the probability they correctly identify 25 or more symbols out of 100.
 - (c) Has the psychic demonstrated his powers beyond reasonable doubt?
6. In a 2015 Gallup poll,¹ 58% of a sample of 1009 U.S. adults supported same-sex marriage. 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.

¹<http://www.gallup.com/poll/184217/support-gay-marriage-stable-high-court-ruling.aspx> . Note: The margin of error Gallup states is different from what we would calculate, because they weight their data to reduce nonresponse bias.