Math 207
Introduction to Statistics

Quiz: Hypothesis Testing

Use `R` as needed. Please work your answer out on scratch paper first and keep your work neat.

1. A box contains three tickets with 0 and one with 1. A random sample of 100 tickets is made.

   a) What is the chance that 30 or more of the selected tickets will be 1?

   b) What is the chance that 20% or less of the tickets will be 1?

2. A die is rolled 100 times and the total number of spots counted. For each of the following cases, determine if the result can be explained as a chance variation. Calculate the test statistic z and the P-value (i.e., the chance of getting a test statistic as extreme or more extreme than the one given).

   a) $n = 10$, sum $= 40$

   b) $n = 100$, sum $= 375$

   c) $n = 225$, sum $= 750$

2. A simple random sample of 100 registered voters in a large city is made. Of this sample, 45% say that they plan to vote for the Coffee party candidate.

a) Find a 95% confidence interval on the city-wide percentage of Coffee party voters.

b) To woo doners, the the Coffee party claims that its recently unknown candidate already has 51% of the vote. Run a hypothesis test using this as the null hypothesis. (That is, assume that the percent of Coffee party voters really is 51% but the observed percentage was 45%. Find z and P.)

c) Repeat part b) based on a 55% claim.

d) Repeat part b) based on a 60% claim.