

## Homework 21: The Central Limit Theorem

1. Wisconsin Tech's basketball team, the Three Point One Four Shooters, have a 70% free-throw percentage.
  - (a) Write a formula for the exact probability that out of their next one hundred free throws, they will make between seventy-five and eighty, inclusive.
  - (b) Approximate the probability of part (a).
2. Fifty-five percent of the registered voters in Mount Pleasant favor their incumbent mayor in her bid for re-election. If four hundred voters go to the polls, estimate the probability that
  - (a) the race ends in a tie.
  - (b) the challenger scores an upset victory.
3. A bank teller serves customers standing in line one by one. Suppose that the service time for a customer has mean 2 (minutes) and variance 0.6, and assume that service times for different bank customers are independent.
  - (a) Find the probability that the time required to serve 50 customers is between 92 and 108 minutes.
  - (b) The bank wants to find a time interval  $(100 - x, 100 + x)$  for which there is a 0.85 probability that the teller can serve 50 customers. Find  $x$ .