Part 6.4: Mixed Questions

1. Two raffles are being run as part of a fundraiser for a school. The first raffle has 500 tickets with a first prize of $500, a second prize of $300 and a third prize of $100. The second raffle has only 200 tickets with a first prize of $1000 a second prize of $500 and a third prize of $200.
    a. Calculate the mean and the standard deviation of the prize amount for the first raffle.
    b. Calculate the mean and the standard deviation of the prize amount for the second raffle.
    c. Which raffle would you expect to have a higher price?
    d. If the school wants to make at least $1000 from the first raffle and $500 from the second raffle, how much should they sell the tickets to for each raffle? (Prices must be whole dollar amounts)
    e. If I purchased 9 tickets to the first raffle and 4 tickets to the second raffle what would I expect my average winnings to be?
2. A large extended family has 3 boys and 5 girls going to the school ball this year. The mean amount that boys spend on their outfit is $213 with a standard deviation of $127. The mean amount girls spend on their outfit is $401 with a standard deviation of $246.
    a. What is the mean and standard deviation for the total amount spent by this extended family on their outfits?
    b. Assuming these amounts are normally distributed calculate the probability the extended family spends more than $3,000 on ball outfits this year?
    c. What assumptions are made in order for the answer in part b. to be calculated?
3. A business is working on two projects. Project A is a smaller job that is likely to cost between $10,000 and $90,000 but the business expects it to cost approximately $40,000. Project B is a larger job that is likely to cost between $100,000 and $300,000, but the best estimate for its cost is $220,000. The business only has $300,000 in its bank account to pay for the two projects.
    Calculate the mean and standard deviation of total cost of the two projects and using a normal approximation calculate the probability the business has enough money to pay for the two projects.
    State any assumptions you are making as you are doing your calculations.