*Instructions:* *All answers must be written only in the space provided.* ***Calculations must be shown for every question marked with an \* at the end, in order to get full credit for it.*** *Partial credit will be given where appropriate. Use α = 0.05 unless mentioned otherwise.*

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1. Use the given sample data *(midterm\_data.dta)* to answer this question.
2. What is the sample mean and standard deviation of the number of steps walked daily?***(2 points)***
3. Calculate and interpret the 90% confidence interval for the average number of steps walked daily. ***(4 points)\****
4. Assume that another random sample of 20 people gave you the same mean and standard deviation as obtained in part (a). Calculate and interpret the new 90% confidence interval for the average number of steps walked daily. Explain in 1-2 sentences why this new 90% C.I. is wider or narrower than the one calculated in part (b). ***(4 points)\****
5. The annual amount (i.e., weight) of food wasted by households is normally distributed, with a mean of 228 pounds and a standard deviation of 52 pounds.
6. What is the probability of a household wasting more than 200 pounds of food in a year?***(3 points)\****
7. What is the probability of a household wasting between 250 and 300 pounds of food in a year?***(3 points)\****
8. How much food (in pounds) will the best 10% households (i.e., those that waste the least amount of food) waste in a year?***(4 points)\****
9. Based on the given sample data *(midterm\_data.dta)*, can we conclude that the proportion of people in the population who are from Colorado is significantly different from 30%?
10. What is the sample proportion of people who are from Colorado? ***(2 points)\****
11. State the null and alternate hypotheses. ***(2 points)***
12. What is the decision rule? ***(2 points)***
13. What is the value of the test statistic? ***(1 point)***
14. What is the decision? Interpret this decision in 1 sentence. ***(2 points)***
15. What is the p-value? ***(1 point)***
16. There is a 14% chance that an adult in Denver will wear a mask in public when not mandated. An adult in Denver will either wear a mask or they will not. The probability of an adult in Denver wearing a mask is independent of the probability of any other adult in Denver wearing a mask. There are 10 adults present in a particular store in Denver.
17. What is the probability that at least one adult in this store is wearing a mask?***(4 points)\****
18. What is the probability that exactly two adults in this store are wearing a mask?***(4 points)\****
19. What is the expected number of mask-wearing adults in this store? ***(2 points)\****
20. Please refer to the population distribution in the graph below.



1. Is the above distribution left-skewed, right-skewed or symmetric?***(2 points)***
2. Without performing any calculations, state with justification which value is greater in the distribution above: the mean or the median?***(2 points)***
3. Would it be appropriate to apply the Empirical Rule to this distribution? Why or why not?***(2 points)***
4. Given that the mean of this distribution is 2500 calories and standard deviation is 370 calories, what percent of data values lie between 1800 and 3200 calories? ***(4 points)\****
5. Based on the given sample data *(midterm\_data.dta)*, can we conclude that the average age of people in the population is significantly greater than 40 years?
6. What is the average age of the people in the sample? ***(2 points)***
7. State the null and alternate hypotheses. ***(2 points)***
8. What is the decision rule? ***(2 points)***
9. What is the value of the test statistic? ***(1 point)***
10. What is the decision? Interpret this decision in 1 sentence. ***(2 points)***
11. What is the p-value? ***(1 point)***