

DUE SUNDAY, APRIL 5. NO LATE EXAMS ACCEPTED.

FOLLOW THESE DIRECTIONS EXPLICITLY. IF YOU DON'T, IT'S NOT MY FAULT.

- 1) Complete this exam by typing your answers into a Word (or similar) document. Be sure to include formulas, what you used in StatCrunch, etc. that let me know that you knew what you were doing in case your calculations are off. You can express any information in words, if you'd like. You can also insert written work. You can include StatCrunch output for a lot of your answers, like you do for a lab. Possible points are listed after each problem number.
- 2) Save the document as a pdf and email it to math232online@gmail.com. Don't know how to do that? Ask Google, a friend or me. *Be sure to copy yourself so you have proof that you sent your exam!!!*
- 3) Please work BY YOURSELF. I know this is a lot to ask, but you'll be happy you did in the long run. Questions? Email your instructor for hints. ☺

#1) (10) Desi and Lucy have a jungle adventure business in Costa Rica. The average number of howler monkeys seen on a one-day excursion is 8. During a one-day excursion, find the probability that the number of howler monkeys seen is:

- a) Ten.
- b) Between 5 and 11, inclusive.

#2) (25) In its Fuel Economy Guide, the Environmental Protection Agency gives a variety of data on 2016 model year vehicles. If outliers (hybrid, gas-electric or electric vehicles) are ignored, the combined city and highway gas mileage is approximately normally distributed with mean 23.0 mpg and standard deviation of 4.9 mpg.

- a) A 2016 Volkswagen Beetle has an average gas mileage of 28 mpg. What percentage of 2016 vehicles have a better mpg than the Volkswagen Beetle?
- b) What is the probability that a 2016 model year vehicle has a gas mileage lower than 30 mpg?
- c) Assume twenty 2016 model year vehicles are randomly selected. Describe the distribution of the variable $\bar{x}$.
 - I. Shape. You must justify (state how you know) your answer.
 - II. Mean.
 - III. Standard deviation. Round to three decimal places.
- d) Find the probability that the mean gas mileage of a sample of twenty 2016 model year vehicles is less than 24 mpg.

#3) (20) The following table shows age distribution and location of a random sample of 166 buffalo in Yellowstone National Park. Suppose a Yellowstone buffalo is selected at random. Use the table to answer the following questions.

			District	
		Lamar	Nez Perce	Firehole
	Calf	13	13	15
Age	Yearling	10	11	12
	Adult	34	28	30

- Find the probability that it is a calf.
- Find the probability that it is from the Firehole district.
- Find the probability that it is a yearling or from the Nez Perce district.
- Find the probability that it is a calf given that it is from the Lamar district.

#4) (20) A recent study found that 27% of adults often purchase used items instead of new ones. Assume a random sample of 75 adults are chosen.

- Describe the distribution of the variable $\hat{p}$.
 - Shape. You must justify (state how you know) your answer.
 - Mean.
 - Standard deviation. Express your answer to four decimal places.
- Find the probability that the percentage of adults out of 75 who often purchase used items is more than 30%.
- Find the probability that the percentage of adults out of 75 who often purchase used items is between 28 and 32%.

#5) (25) Jojo has just been given a 10-question multiple-choice quiz in history class. Each problem has five possible answers and only one is correct. Since Jojo hasn't attended class recently, he doesn't know any of the answers. Assume Jojo guesses on all 10 questions.

- Find p , the success probability. Express your answer as a decimal.
- Use your answer to part a to find the probability that Jojo gets at least one question correct.
- Use your answer to part a to find the probability that Jojo gets no question correct.
- Find the mean number of correct answers out of 10.
- Find the standard deviation of correct answers out of 10. Express your answer to two decimal places.