

Final Exam: Some problems for review

The exam will be taken in the regular classroom SCB 303:

- Section 1: Thursday, 10:00 AM – noon
- Section 2: Friday, 1:00 – 3:00 PM

You need to bring your laptop and calculator (of any kind). You are not allowed to use any app on your laptop, even a calculator app. Your web browser can only have 3 tabs opened: Canvas, MyLab, StatCrunch. **StatCrunch can serve as a scientific calculator: Data → Compute → Expression.** The browser should occupy the full screen at all time. Phones and notecard are not allowed. The instructor will provide scratched papers for you. When you are seated, go to Canvas and click on link for Final Exam on the home page. You will be directed to MyLab Statistics, which will ask you for an access code. The instructor will give you the access code.

Other exam policies:

The proctor may reassign your seat at the beginning or at any time during the exam.

Your laptop screen must be bright enough for the proctor to see your screen activities without difficulties.

Using a phone or any unauthorized assistance while the exam is in progress, whether inside or outside of the classroom, is prohibited.

If you need to leave the room for any reason, you must first obtain the proctor's permission. If the proctor is not present in the room and you want to leave, you must wait until he/she comes back. If you finish your exam, you must notify the proctor immediately. He/she will then ask you to log out of the exam and close your browser.

Violation of any of the above policies will be considered as cheating and may result in a score of zero.

The textbook sections to be covered are 6.3, 7.1-7.5, 8.1-8.4, 10.1-10.3. You should review the homework problems, worksheets, quizzes, examples given in the lectures. It is always a good idea to study for the exam with someone.

Some problems to practice:

1) You roll a pair of fair dice 200 times and count the number of times the sum of face values is equal to 4.

a) Let X be the sum of face values in an experiment. Find $P(X = 4)$.

b) Verify that the number of times the sum of face values is equal to 4 is approximately a normal distribution. Find the mean and standard deviation of that distribution.

c) According to the Empirical Rule, about 95% of all 200-rolls, the number of times you get the sum of face values equal to 4 is between _____ and _____. Round to the nearest whole numbers.

2) A university has 8,500 undergraduate students. The registrar wants to study enrollment in Calculus I. A random sample of 200 students is selected, and 74 of them are enrolled in Calculus I this semester. University records show that 32% of all undergraduate students are enrolled in Calculus I.

- a) What is the population?
- b) What is the sample?
- c) What is the sample size?
- d) Compute the sample proportion of students enrolled in Calculus I.
- e) Identify the population proportion.
- f) Is 74 a statistic, a parameter, or neither?

3) A school nurse reports that 35% of students wear glasses (or contact lenses). Suppose you take a random sample of 100 students.

- a) What value should you expect for the sample proportion?
- b) What does the Central Limit Theorem say about the distribution of the sample proportion? Check if the conditions to use the Central Limit Theorem are met.
- c) Find the mean and standard deviation of the sample proportion.
- d) Complete the sentence:
We expect _____% to wear glasses or contact lenses, give or take _____%.
- e) Suppose you increased the sample size from 100 to 400. What effect would this have on the standard error? Recalculate the standard error.
- f) What is the chance that 50 or more students in the sample wear glasses? Answer using the Standard Normal Table and answer using StatCrunch.

4) A researcher takes a random sample of 400 households from 1.2 million households in a state. He/she finds that 72 households have solar panels.

- a) Find the sample proportion.
- b) Find an estimate for standard error.
- c) What does the Central Limit Theorem say about the proportion of households in the state that have solar panels? Check if the conditions to use the Central Limit Theorem are met.
- d) Find the 95% confidence interval for the proportion of all households in the state who have solar panels. Find the margin of error.