

**Calculus II**  
**Homework Eight**  
**Due Friday March 1, 2019**

**Link to Webwork:** <https://courses1.webwork.maa.org/webwork2/COA-ESL024>

**Chapter 8.7:**

- WeBWorK Assignment: 07Chapter8.7and8.8
- Textbook Problems:
  1. None

**Normal Distributions**

1. The height of giraffes is distributed according to a normal distribution with a mean of 5.2 and a standard deviation of 0.6.
  - (a) What fraction of giraffes are less than 4 meters tall?
  - (b) What fraction of giraffes are between 5 and 6 meters tall?
  - (c) What fraction of giraffes are more than 5.5 meters tall?

Answer these questions two ways:

- Using WolframAlpha to evaluate the integrals. You do not need to show printouts from wolfram alpha, but you should write down the integrals that you are asking wolfram alpha to solve for you.
  - Converting to  $z$  and using a  $z$ -table. See, e.g., [www.stat.ufl.edu/~athienit/Tables/Ztable.pdf](http://www.stat.ufl.edu/~athienit/Tables/Ztable.pdf). Briefly explain how you used the  $z$  table to answer each of the questions.
2. Darron Collins is interested in the heights of COA students compared to Hampshire students. A careful study reveals that COA students have an average height of 63 inches and a standard deviation of 4 inches. Darron then sends a team of researchers on a trip to Massachusetts to measure the heights of some Hampshire students. The RA team manages to convince 25 Hampshire students to be measured. The mean of these 25 Hampshire students is 64 inches.
    - (a) If you sampled 25 COA students, how would the mean of that sample be distributed?

- (b) Given this distribution, what is the z-score for the measured average height of Hampshire students?
  - (c) How likely is it that sampling 25 COA students would lead to a mean equal to more more extreme<sup>1</sup> than the mean you found?
  - (d) Given this experiment do you think it is likely that the average heights of Hampshire and and COA students are the same?
3. Repeat the above question, but suppose that the RAs measured 100 Hampshire students and found an average height of 64 inches.

### Chapter 9.1:

- WeBWorK Assignment: 07Chapter9.1
- Textbook Problems:
  - 1. 2
  - 2. 4
  - 3. 8
  - 4. 10
  - 5. 20-28 (even only)

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<sup>1</sup>Note that unlike in the unicorn example,  $z$  is now positive. So you'll have to think a little about how to interpret "more extreme than" for this case.