Calculus II
Homework Eight
Due Friday 25 February, 2011

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 0.3.

    (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 or sage to do the integrals
    - Converting to z and using a z-table. See, e.g., `http://en.wikipedia.org/wiki/Standard_normal_table`.

2. Sarah Luke 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. Sarah then sends a team of RAs 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 67 inches. The standard deviation of this sample of Hampshire students is 3.

    (a) What is the null hypothesis?
    (b) What is the p-value?
    (c) Should you reject the null?

Chapter 8.6:

1. 7
2. 12
3. A certain set of solar cells will produce 20 kWh of energy a day. In Maine one kWh is worth about 17 cents.

(a) What is the present value of the income stream provided by the solar cells? Assume that the solar cells will operate for 15 years.

(b) What is the present value of the income stream if the solar cells operate forever?

(c) **Optional:** What is the internal rate of return of the solar cells, assuming a fifteen year lifetime and that the solar cells cost $10,000?

Chapter 9.1:

1. 2
2. 4
3. 6
4. 8
5. 10
6. 14
7. 56