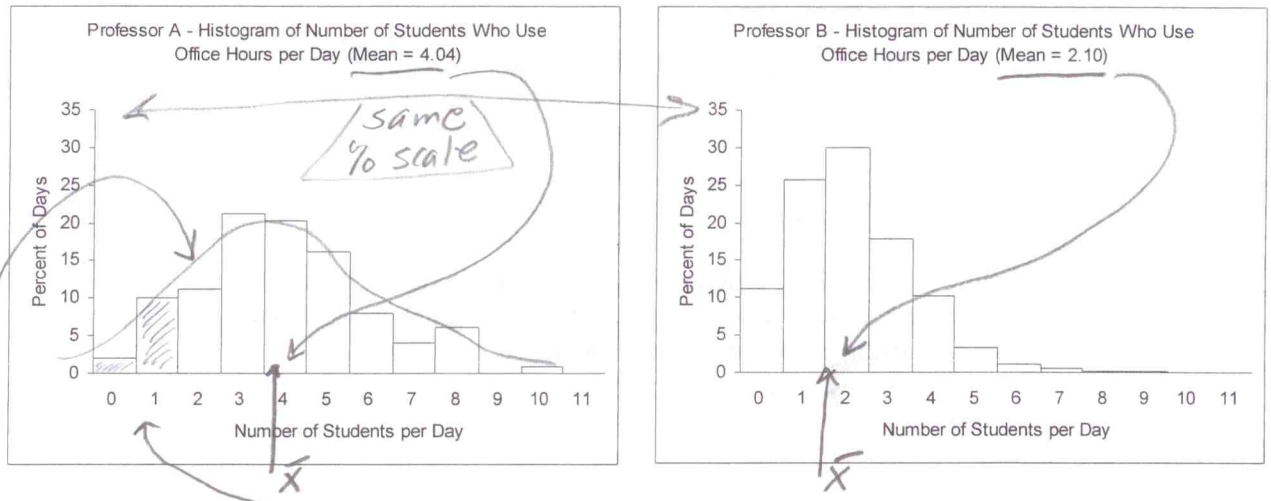
Pledge:

9/19/2005 MATH271 – Applied Statistics Name: Solution
Dr. Lunsford Quiz 3 20 Points Total

I. Last semester two professors kept track of the number of students who visited their office hours. Each day of the semester each professor recorded the number of students who came to their office hours for help. Below are the histograms for each professor. Please use these histograms to answer the following questions: (10 points total)



(a) Approximately what percent of days last semester did Professor A have no more than one student (i.e. either none or one) visit her office? (2 points)

$\approx$ 2+10 or 12%

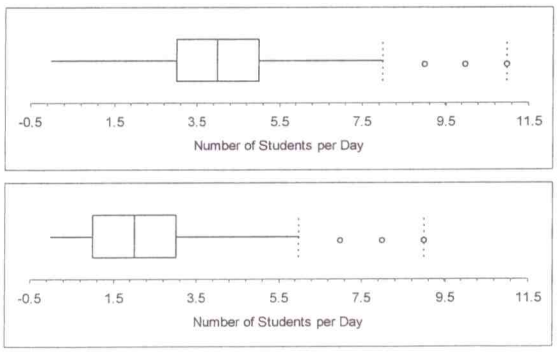
(b) Based on the histogram, will the *median* number of students who visited Professor A per day during her office hours last semester be larger, smaller, or about the same as the *mean* number of students who visited Professor A per day? Why? (3 points)

About the same since the graph is roughly symmetric
OR
Slightly less due to the slight right skew of the distribution. (pulls mean higher)

(c) Based on the histograms above, determine which Professor's histogram has a smaller *standard deviation*. Justify your answer. (3 points)

Prof. B's histogram has a smaller standard deviation because more of their data is located closer to the mean than Prof A's histogram.

(d) Below you are given two boxplots of the same data in the histograms above. Clearly indicate which box plot corresponds to which histogram. (2 points)

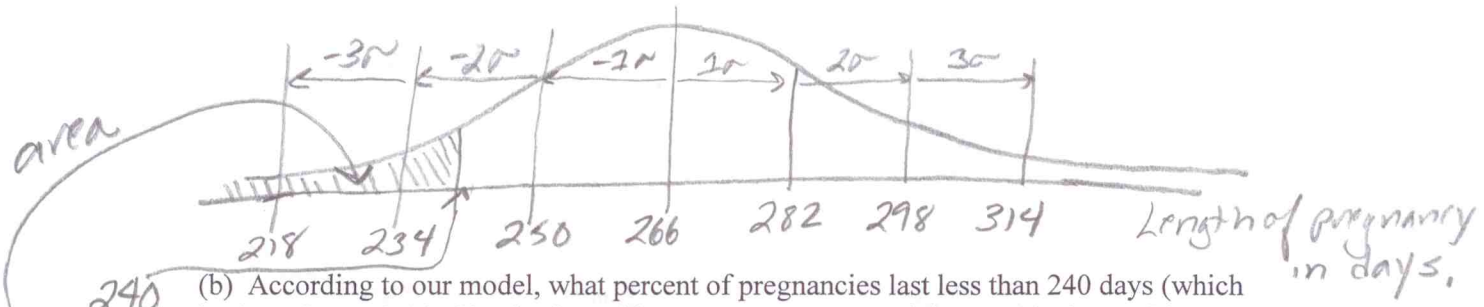


Prof A

Prof B

II. The length of human pregnancies from conception to birth varies according to a distribution that is approximately normal with mean 266 days and standard deviation 16 days. Please use this information to answer the following questions: (10 points total)

(a) Draw a graph of the density function that represents the length of a human pregnancy. Please be sure to label your axis and to clearly mark the data values that are $\pm 1\sigma$, $\pm 2\sigma$, and $\pm 3\sigma$ from the mean. (4 points)

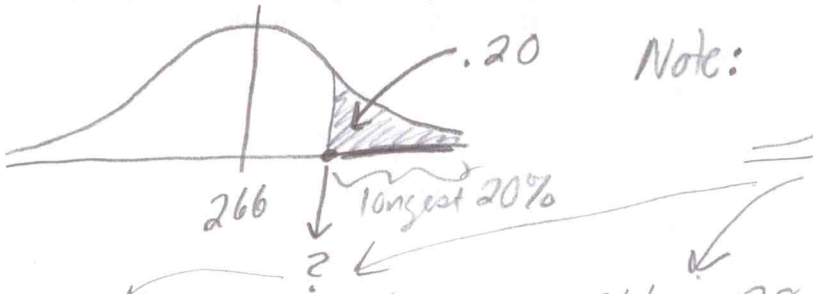


(b) According to our model, what percent of pregnancies last less than 240 days (which is about 8 months)? Clearly show this percent on your graph in part (a) above. Please give your answer using a complete English sentence. (3 points)

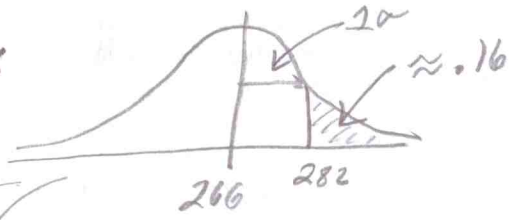
normalcdf(-1E99, 240, 266, 16) = .05208

Approximately 5.2% of pregnancies last less than 240 days.

(c) According to our model, how long do the longest 20% of pregnancies last? Again, give your answer using a complete English sentence. (3 points)



Note:



so ? must be between 266, 282, probably closer to 282. (via empirical rule)

invNorm(.8, 266, 16) = 279.465

The longest 20% of pregnancies last at least 279.5 days.