Wins in Major League Baseball

1. In 2009, the mean number of wins was 81 with a standard deviation of 11.4 wins.

Find and interpret the $z$-scores for the following teams.

(a) The New York Yankees, with 103 wins.

(b) The New York Mets, with 70 wins.

Batting Averages

2. In the previous alternate example about batting averages for Major League Baseball players in 2009, the mean of the 432 batting averages was 0.261 with a standard deviation of 0.034. Suppose that the distribution is exactly Normal with $\mu = 0.261$ and $\sigma = 0.034$.

(a) Sketch a Normal density curve for this distribution of batting averages. Label the points that are 1, 2, and 3 standard deviations from the mean.

(b) What percent of the batting averages are above 0.329? Show your work.

(c) What percent of the batting averages are between 0.227 and .295? Show your work.
3. According to the CDC, the heights of 3 year old females are approximately Normally distributed with a mean of 94.5 cm and a standard deviation of 4 cm. Be sure to draw curves for each calculation!

(a) What is the third quartile of this distribution?

(b) What is the median of this distribution?

(c) If a 3 year old female was 91.7 cm tall, what percentile would she be in?

(d) If a mother knew her daughter was at the 91st percentile in height, how tall is her daughter?

(e) If a 3 year old female was 96.4 cm tall, what percentile would she be in?

4. Scores on the Wechsler Adult Intelligence Scale (a standard IQ test) for the 20 to 34 age group are approximately Normally distributed with $\mu = 110$ and $\sigma = 25$. For each part, follow the four-step process.

(a) At what percentile is an IQ score of 150?

(b) What percent of people aged 20 to 34 have IQs between 125 and 150?

(c) MENSA is an elite organization that admits as members people who score in the top 2% on IQ tests. What score on the Wechsler Adult Intelligence Scale would an individual have to earn to qualify for MENSA membership?