Stat 2153 - Statistical Methods

Quiz #7 - 2008.04.01

Solutions

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1. Assuming that event x comes from a normally distributed set of data, find the probability that event x will occur if we know that its z-scores lie between -1.23 and 0.67.

We are looking for $P(-1.23 \leq z \leq 0.67)$ for the standard normal distribution:

$$\begin{aligned} P(-1.23 \leq z \leq 0.67) &= P(z \leq 0.67) - P(z \leq -1.23) \\ &= 0.7486 - 0.1093 \\ &= 0.6393 \end{aligned}$$

2. As discussed in class and in section 6.3, the weights of adult men are distributed normally with mean 172 pounds and deviation 29 pounds. What is the probability that a randomly selected man will have a weight between 136.33 and 191.43 pounds?

First we find the z-score for each of 136.33 and 191.43 pounds. The z-score for 136.33 pounds is $z = -1.23$, and for 191.43 it is 0.67. We therefore need to compute $P(-1.23 \leq z \leq 0.67)$. This is what was done in problem 1, therefore, the probability that a randomly selected man will have a weight between 136.33 and 191.43 pounds is approximately 0.6393, or almost 64%.