MA145 - ASSIGNMENT 5

Name:

Problem 1 The mean gas mileage for the 2005 Honda Insight with an automatic transmission is 56 miles per gallon on the highway. Suppose that the mileage is approximately normally distributed with a standard deviation of 3.2 miles per gallon.

a) What proportion of these cars gets over 60 mpg on the highway?

b) What proportion of these cars get 50 mpg or less on the highway?

c) What proportion of these cars get between 58 and 62 mpg on the highway?

d) What is the probability that a randomly selected 2005 Honda Insight gets less than 45 mpg on the highway?

e) What is the $90th$ percentile highway mileage for 2005 Honda Insights?

f) What is the $30th$ percentile highway mileage for 2005 Honda Insights?

g) Suppose a sample of 50 2005 Honda Insights is taken and the highway gas mileage is measured. What is the probability that the sample mean $\overline{x}$ is between 55.5 and 56.5 mpg?

h) Suppose a sample of 100 2005 Honda Insights is taken and the highway gas mileage is measured. What is the probability that the sample mean $\overline{x}$ is between 55.5 and 56.5 mpg?

Problem 2 In the U.S. the mean height of females age 20 to 29 is $\mu = 64.1$ inches. If height is approximately normally distributed with a standard deviation $\sigma = 2.8$,

a) What is the percentile rank of a 20-29 year old female who is 60 inches tall?

b) What is the percentile rank of a 20-29 year old female who is 70 inches tall?

c) What proportion of 20-29 year old females are between 60 and 70 inches tall?

d) What proportion of 20-29 year old females are between 55 and 64 inches tall?

e) What is the probability that the mean $\overline{x}$ of a sample of 60 20-29 year old females is between 63.8 and 64.2 inches tall?

f) What is the probability that the mean $\overline{x}$ of a sample of 120 20-29 year old females is between 63.8 and 64.2 inches tall?

g) What is the $75th$ percentile of the heights of 20-29 year old females?

h) What is the $25th$ percentile of the heights of 20-29 year old females?

Problem 3 A television rating service calls $35,000$ households during a certain program. If the actual percentage of households that are tuned into the show is 55,

a) What is the probability that the number of households tuned in is between 19050 and 19450?

b) What is the probability that the number of households tuned in is between 19210 and 19290?

c) What is the probability that the number of households tuned in is less than 19300?

d) What is the probability that the number of households tuned in is greater than 19200?

e) What is the probability that the number of households tuned in is less than 19150 or more than 19350?