Section 7.2 — Central Limit Theorem with Means

Chris Godbout

Examples

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Walking Step Lengths

Suppose that the walking step lengths of adult males are normally distributed with a mean of 2.4 feet and a standard deviation of 0.3 feet. A sample of 34 men's step lengths is taken.

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2. Find the probability that the mean of the sample is less than 2.1 feet.
3. Find the probability that the mean of the sample is greater than 2.5 feet.

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3. Find the probability that the mean of the sample is greater than 2.5 feet.
4. Find the probability that the sample mean differs from the population mean by more than 0.06 feet.

The mean wait time for a drive-through chain 193.2 seconds with a standard deviation of 29.5 seconds. What is the probability that for a random sample of 45 wait times, the mean is between 185.7 and 206.5 seconds?

Elevator Safety

Assume men's weights are normally distributed with a mean of 182.9lb and a standard deviation of 40.8lb. A given elevator can hold 3125lb. 16 male passengers have just loaded onto the elevator.

1. What's the highest mean weight for the passengers so that they do not exceed the weight limit?

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2. What's the probability that the 16 male passengers exceed the weight limit?

Hats

Women have head circumferences that are normally distributed with a mean of 22.65in and a standard deviation of 0.80in. A hat company produces women's hats that fit head circumferences between 21.00in and 25.00in.

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1. What percentage of women can fit into the hats?
2. If 64 women are selected at random, what is the probability that their mean head circumference is between 21.00in and 25.00in?
3. I want to know if an order of 64 hats will likely fit each of the women. Which of the previous numbers do I want?