

1. General practice physicians earned an average of \$100,240 in 1994. The standard deviation of the earnings was \$10,750. The distribution of these salaries is approximately Normal. Determine the probability that a random sample of 100 general practitioners had a mean income of at least \$100,000.
2. Twenty percent of all personal computers sold in 1995 were through mail order and the average amount spent on systems purchased through the mail was \$2,850. The standard deviation of the costs was \$600. Determine the probability that the mean price of 100 randomly selected mail order computer sales will be less than \$2700.

3. Lean, trimmed, 3-ounce tenderloin steaks contain an average of 174 calories. Suppose the standard deviation of each steak is 10 calories. If a person eats one of these steaks each week for a year, what is the probability that the average number of calories consumed per steak will be less than 175?

4. An insurance company claims that in the entire population of homeowners, the mean annual loss from fires is \$250 and the standard deviation of the loss is \$1000. The distribution of losses is strongly skewed-right; many policies have \$0 loss, but a few have large losses. An auditor examines a random sample of 10,000 of the company's policies. If the company's claim is correct, what's the probability that the average loss from fire in the sample is no greater than \$275? Show your work.

5. In response to the increasing weight of airline passengers, the Federal Aviation Administration (FAA) told airlines to assume that passengers average 190 pounds in the summer, including clothes and carry-on baggage. But passengers vary, and the FAA did not specify a standard deviation. A reasonable standard deviation is 35 pounds. Weights are not Normally distributed, especially when the population includes both men and women, but they are not very non-Normal. A commuter plane carries 30 passengers. Find the probability that the total weight of 30 randomly selected passengers exceeds 6000 pounds. Show your work (HINT: to apply the central limit theorem, restate the problem in terms of the mean weight)

6. The average age of men at the time of their first marriage is 24.8 years. Suppose the standard deviation is 2.8 years. Forty-nine married males are selected at random and asked the age at which they were first married. Find the probability that the sample mean will be

a. more than 26

b. less than 24

c. between 24.2 and 25.5