Applying Sampling Distribution Models for $\overline{x}$

1. A convention of sumo wrestlers is held at a hotel. The weight of sumo wrestlers is known to be normally distributed with a mean of $\mu = 540$ pounds and a standard deviation of $\sigma = 45$ pounds. The hotel elevator can accommodate 9 wrestlers at a time. Suppose that a simple random sample of 9 wrestlers enters the elevator. The elevator will fail if the total weight of the occupants exceeds 5000 pounds. What is the chance that the elevator will fail to operate? (Hint: change the criterion for failing to operate from “total weight exceeding 5000 pounds” to “mean weight for 9 people exceeding __________ pounds.”

2. During calendar year 2002 the candidates for the Certified Public Accountant (CPA) exam had taken an average of 141.3 semester hours of credit with a standard deviation of 17.77 credit hours. If a random sample of $n=64$ 2002 CPA exam candidates is selected, what is the probability that the sample mean number of credit hours $\overline{x}$ is between 137 and 144?