6.66 a. The Central Limit Theorem states that the sampling distribution of $\overline{y}$ is approximately normally distributed with a mean of $\mu_{\overline{y}} = \mu = 0.53$ and $\sigma_{\overline{y}} = \sigma/\sqrt{n} = 0.193/\sqrt{50} = 0.02729$.

6.68 **Handrubbing**

$$\mu_{\overline{y}} = \mu = 35, \quad \sigma_{\overline{y}} = \frac{\sigma}{\sqrt{n}} = \frac{59}{\sqrt{50}} = 8.344$$

Handwashing

$$\mu_{\overline{y}} = \mu = 69, \quad \sigma_{\overline{y}} = \frac{\sigma}{\sqrt{n}} = \frac{106}{\sqrt{50}} = 14.991$$

6.76 a. The definition of a chi-square random variable states: If x_i has a χ^2 distribution with 1 degree of freedom, then $\mu = 1$ and $\sigma^2 = 2$. Using the modification of Theorem 6.9, the sampling distribution of $\sum_{i=1}^{n} x_i$ is approximately normal with mean $\mu_{\sum x_i} = n\mu = n$ and $\sigma^2_{\sum x_i} = n\sigma^2 = 2n$. Thus, for $y = \sum x_i$, the distribution of y is approximately normal with mean $\mu = n$ and standard deviation $\sigma = \sqrt{2n}$.