



- 3.** One group of 10 men and one group of 35 women had their heart rates monitored while being subjected to a stress situation. (40 points)
- a.** For the men, the mean number of heartbeats per minute was 126, and the standard deviation of the sample was 4. Find the 95% confidence interval of the true mean.
- b.** For the women, the mean number of heartbeats per minute was 115. Assume that the population standard deviation is known to be 3. Find the 99% confidence interval of the true mean.

4. The probability of winning on a certain slot machine is 12%. A person plays this slot machine one-hundred times. Use the normal approximation to the binomial distribution to find the probability that this person will win at least 18 times. (32 points)

### Formulas

$\hat{p} - E < p < \hat{p} + E$	$E = z_{\alpha/2} \sqrt{\frac{\hat{p}\hat{q}}{n}}$	$n = \hat{p}\hat{q} \left( \frac{z_{\alpha/2}}{E} \right)^2$	$\hat{p} = \frac{X}{n}$	$\hat{q} = 1 - \hat{p} = \frac{n - X}{n}$
$\bar{X} - E < \mu < \bar{X} + E$	$E = z_{\alpha/2} \left( \frac{\sigma}{\sqrt{n}} \right)$	$n = \left( \frac{z_{\alpha/2} \cdot \sigma}{E} \right)^2$	$\mu = np$	$z = \frac{X - \mu}{\sigma}$
$\bar{X} - E < \mu < \bar{X} + E$	$E = t_{\alpha/2} \left( \frac{s}{\sqrt{n}} \right)$	$d.f. = n - 1$	$\sigma = \sqrt{npq}$	$z = \frac{\bar{X} - \mu}{\sigma / \sqrt{n}}$