Chapter 20, problem 8. There is about a 50-50 chance that the percentage of Democrats in the sample will be bigger than 40%, which is the percentage Democrats in the town's population.

The explanation is that the percentage of Democrats in the sample is expected to be 40%, plus or minus chance error (the standard error), and the chance error is just as likely to be positive as negative. So it is just likely that the sample percentage will be greater than 40% as lower than 40%.

Chapter 21, Review Problem 12: The correct answer is (ii). If the 2% margin of error is one standard error, then most of the confidence intervals — in this case 68% of them — produced this way will cover the true population percentage. If 2% is two standard errors, then 95% of these intervals will cover the true percentage. Etc.

So, *most*, but not *virtually all*.

Chapter 23, Review Problem 2:

(a) **True.** The standard error (for average) in this example is

$$SE \approx \frac{2.3}{\sqrt{500}} \approx 0.1,$$

so this is the amount by which the sample average should be off the box average.

(b) **True.** A 68%-confidence interval is (sample average $\pm$ SE).

(c) **False.** The standard error 0.1 estimates the spread of the sample averages around the average of the box. The SE does not describe the spread around the average of the tickets in the box — this spread is estimated by the (sample) SD = 2.3. (Moreover, there is no reason to believe that the tickets in the box have a normal distribution.)

Chapter 23, Review Problem 9: The standard error here is

$$SE \approx \frac{2.3}{\sqrt{2500}} = 0.046,$$

so a 95%-confidence interval is given by

$$1.7 \pm 0.092.$$