Step 6: If using technology to find the shaded region in Figure 6-21, we get 0.0066. If using Table A-2 to find the shaded area in Figure 6-21, we find the two z scores corresponding to 234.5 and 235.5. We use those two z scores to find the cumulative area to the left of 234.5 and the cumulative area to the left of 235.5, then we find the *difference* between those two areas. Let's begin with the total area to the left of 235.5. If using Table A-2, we must first find the z score corresponding to 235.5. We get

$$z = \frac{235.5 - 215.5}{10.380270} = 1.93$$

We use Table A-2 to find that $z = 1.93$ has a cumulative left area of 0.9732. Now we find the area to the left of 234.5 by first finding its corresponding z score:

$$z = \frac{234.5 - 215.5}{10.380270} = 1.83$$

We use Table A-2 to find that $z = 1.83$ corresponds to a cumulative left area of 0.9664. Using Table A-2 the shaded area of Figure 6-21 is $0.9732 - 0.9664 = 0.0068$.

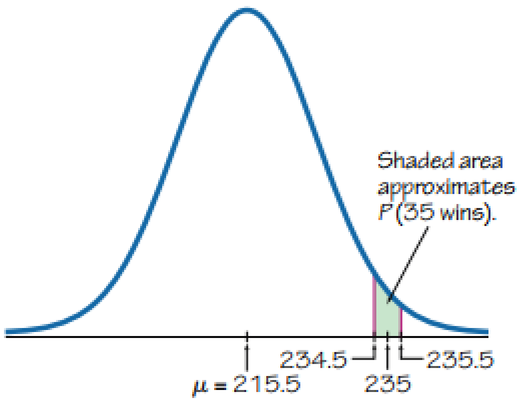

Figure 6-21 **Probability of Exactly 235 Wins**

Interpretation

If we assume that the overtime coin toss does not favor either team, then among 431 teams that won the overtime coin toss, the probability of *exactly* 235 wins is 0.0068. This result is not very helpful in determining whether the overtime coin toss is fair. If the coin toss gives no advantage, we expect that in 431 overtime games, the team winning the coin toss would win about 215.5 times (about half of the time). But we see that there are 235 wins, which is more than 215.5. The relevant result is the probability of getting a result *at least as extreme* as the one obtained, so the relevant result is the probability of *at least* 235 wins (as in Example 1), not the probability of exactly 235 wins (as in this example). See the following comments about interpreting results, and see Section 5-2 for the comments under the heading of "Unusually High or Unusually Low Number of Successes: Not *Exactly*, but At Least as Extreme."

Interpreting Results

When we use a normal distribution as an approximation to a binomial distribution, our ultimate goal is not simply to find a probability number. We often need to make some *judgment* based on the probability value. The following criterion (from Section 5-2)