1. Consider the performance of the 4170 mutual funds reported in the Wall Street Journal over a 10-year period. Suppose that the performance of each fund is random in the sense that each fund has a 50–50 chance of “beating the market” (i.e. outperforming a broad index such as the S&P 500) in any year, and that performance is independent from year to year.

(a) Find the probability that a specified fund (say SuperDuper Fund) outperforms the market in all 10 years.

(b) Find the probability that at least one fund out of the 4170 beats the market in all 10 years. What do you make of your answer?

2. Let \( X (0 \leq X \leq 1) \) denote the proportion of adults over 65 who are employed (i.e. the elderly employment rate). Suppose that across the counties in the United States \( X \) has a cumulative distribution function (cdf) given by \( F(x) = 3x^2 - 2x^3 \) for \( 0 \leq x \leq 1 \). Find the probability that the elderly employment rate for a given county is at least 60 percent (0.6). (Note: integration is not required.)

3. Do the exercise that appears on page 6 (at the end of section 7) of the “Notes on probability” at [http://users.wfu.edu/cottrell/ecn215/](http://users.wfu.edu/cottrell/ecn215/). Add the following questions:

(a) Is the expected value of the average of the two dice also the most likely outcome?

(b) Is obtaining the expected value “more likely than not”? (That is, does this occurrence have a probability greater than 0.5?)