1. (Problem 11, Section 1.5) A point \((x, y)\) is to be selected from the square \(S\) containing all points \((x, y)\) such that \(0 \leq x \leq 1\) and \(0 \leq y \leq 1\). Suppose that the probability that the selected point will belong to each specified subset of \(S\) is equal to the area of that subset. Find the probability of each of the following subsets:

   a. the subset of points such that \((x - 1/2)^2 + (y - 1/2)^2 \geq 1/4\);
   b. the subset of points such that \(1/2 < x + y < 3/2\);
   c. the subset of points such that \(y \leq 1 - x^2\);
   d. the subset of points such that \(x = y\).

2. (Problem 6, Section 1.6) If three fair coins are tossed, what is the probability that all three faces will be the same?

3. (Problem 7, Section 1.7) If 12 balls are thrown at random into 20 boxes, what is the probability that no box will receive more than one ball?