First Step Analysis

1. (*) Suppose 100 lily pads are positioned along the circumference of a circle. At 99 of these pads are tasty lily flowers, and at 1, there is a hungry frog. Every minute, the frog hops to one of the adjacent lily pads (with equal probability), and if there is a flower on that pad, the frog eats it.

   (a) What is the probability that the flower directly opposite the frog's initial position is eaten last?

   (b) Show that any lily is equally likely to be the last eaten (including those immediately to the left and right of the frog!).

Conditional Probability in R

2. (*) Create an R function of 3 variables (a, b, p) that performs one game of gambler's ruin, assuming the first gambler starts with $\$a$, that the second starts with $\$b$, and that the first player has probability p of winning each bet. The output of the function should be the winner of the game.

   Then use your function to approximate the probability that the first gambler wins, if $a = 2, b = 8$ and $p = 0.6$. Compare to the theoretical probability calculated in Section 2.7.