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Question 1.

A densely populated country decides to enforce a strict policy on the number of children per family. The problem is that there is a preference for sons, and every family would like to have at least one boy. The policy is as follows:

Each family may have as many daughters as they want, but they must stop having children after their first son is born.

Assume the following:
1. Every family continues to have children until their first son.
2. All children survive.
3. Boys and girls are equally likely to be born.

Part a: Will the number of girls in the country exceed the number of boys?

Part b: Keeping assumptions (2) and (3), we try and devise a new policy such that the expected number of boys exceeds the expected number of girls in the population as a whole. Does such a policy exist?