5.12 (two children) I have two children. At least one of them is a girl. What is the probability that the other one is also a girl?

§ Let the genders of my two children be binary variables \( c \) and \( d \), and let girl be 1 and boy be 0. We say that at least one of them is a girl this way: \( c \lor d \). But a binary expression may not be a distribution, so we divide by the sum to make a distribution.

\[
\frac{(c \lor d)}{(\Sigma c, d \cdot c \lor d)} \quad \text{do the sum}
\]

\[
= \frac{(a \lor b)}{3}
\]

Now we want to ask if both my children are girls; that's \( c \land d \). So we put primes on the given information and compose it with the question.

\[
\frac{(c' \lor d')}{3} \cdot c \land d \quad \text{replace .}
\]

\[
= \Sigma c'', d'' \cdot (c'' \lor d'') / 3 \times (c'' \land d'') \quad \text{do the sum}
\]

\[
= 1/3
\]

The probability that my other child is also a girl is \( 1/3 \).