1.

Intro

By the problem statement, we expect that the two questions will ask similar things, but will have different answers.

Solution

a)

Intuitive solution:

Before we made the question the sample space was:

$$\Omega \ = \{BB, GG, BG, GB\}.$$

Where, B represent a boy and G represent a girl. For instance, BG represent the event where the first child is a boy and the second child is a girl.

When the neighbor answer our question affirmatively, he is saying that he has at least one boy. So, the new sample space is composed by:

$$\Omega \ = \{BB, BG, GB\}.$$

Thus, eliminating the event where there were two girls. Therefore, the probability of having a girl is:

$$\frac{|\{BG, GB\}|}{|\Omega|} = \frac{2}{3}.$$

Formal solution:

Random variables

B - number of boys

G - number of girls

The neighbor tell us that B $\geq$ 1.

$$P(G = 1|B \geq 1) = \frac{P(G = 1, B \geq 1)}{P(B \geq 1)} = \frac{\frac{2}{4}}{\frac{3}{4}} = \frac{2}{3}.$$

b)

Intuitive solution:

Knowing the sex of one kid has no influence whatsoever on the sex of the other kid. So, there is a 50 % chance of the other child being a girl.

Formal solution:

Events

S - sex of the known child

T - sex of the unknown child

$$P(T = G|S = B) = \frac{P(T = G, S = B)}{P(S = B)} = P(T = G) = \frac{1}{2}$$

Conclusion

As suspected, the two questions had different answers despite being similar . The lesson here is to not confuse semantically close statements in the english language with close answers in the probabilistic framework. Be sure to always translate the information and the question into the probabilistic framework before jumping into any conclusion.