Day 3 More probability tasks

Task 1
Suppose a family has 2 children, one of which is a boy. What is the probability that both children are boys?

Walkthrough
The sample space of two children, where B denote boy and G denote girl, is {BB, BG, GB, GG}, with each event having an equal probability of 1/4.

When we know that one of the children is a boy, we know that the case with 2 girls is not possible. Then we have three options where one of the children is a boy, {BB, BG, GB}.

The probability that both children are boys is then 1/3.

Task 2 Cards of the Same Suit
You draw 2 cards from a standard 52-card
deck without replacing them. What is the probability that both cards are of the same suit?

Walkthrough
There is 13 cards in a suit. The first card you draw can be any card 52/52.
After you have drawn the first card, there is 51 cards left in the deck. Of those 51 cards, only 12 will be in the same suit as the first drawn card.

The probability of the second card being of the same suit is 12/51

Task 3 Drawing Marbles
A bag contains 3 red marbles and 4 blue marbles.
Then, 2 marbles are drawn from the bag, at random, without replacement. If the first marble drawn is red, what is the probability that the second marble is blue?

Walkthrough
If the first marble drawn drawn is red, then there will be 6 marbles left in the bag. 2 red ones and 4 blue ones.

The probability of drawing a blue marble is then 4/6 which reduces to 2/3.