



## Why

Given that we know that one event has occurred, we want language for what the new probabilities should be.<sup>1</sup>

## Definition

Consider two events, the second of which has non-zero probability. The *conditional probability* of the first event *conditioned* on a second event is the result of dividing the probability of the second event into the probability of the intersection of the two events.

## Notation

Let  $\mathbf{P}$  be the event probability function. Let  $A$  and  $B$  be two events with  $\mathbf{P}(B) \neq 0$ . We denote the conditional probability of  $A$  conditioned on  $B$  by  $\mathbf{P}(A \mid B)$ ; defined by

$$\mathbf{P}(A \mid B) = \frac{\mathbf{P}(A \cap B)}{\mathbf{P}(B)}.$$

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<sup>1</sup>Future editions will improve.



