Probability - Outcomes and Events

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A sample space is the set of all possible outcomes of an experiment.

An event is a set of outcomes from the sample space.

For equally likely outcomes, probability is favourable outcomes divided by total outcomes.

A fair six-sided die has the sample space 1, 2, 3, 4, 5 and 6.

The event of rolling an even number on a fair die contains 2, 4 and 6.

The probability of rolling an even number on a fair die is 3/6, or 1/2.

The probability of rolling a 7 on a standard six-sided die is zero.

An impossible event has probability zero. A certain event has probability one.

Probability - Complements and Independence

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The complement of an event contains the outcomes outside that event.

The probability of an event and its complement add up to one.

If the probability of rain is 0.3, the probability of no rain is 0.7.

Two events are independent when one does not change the probability of the other.

For independent events, multiply their probabilities to find the probability of both.

Two independent fair coin tosses have outcomes HH, HT, TH and TT.

The probability of two heads in two independent fair coin tosses is 1/4.

Mutually exclusive events cannot occur together in a single experiment.

Rolling a 1 and rolling a 2 in a single die roll are mutually exclusive events.