

Problem

In a single toss of 2 fair (evenly-weighted) six-sided dice, find the probability that the values rolled by each die will be different and the two dice have a sum of 6.

Solution

There are 36 possible combinations of digits on two dice.

$$\Omega = 6^2 = 36$$

Possible values with sum of 6:

Die 1	Die 2
1	5
2	4
4	2
5	1

There are 4 possible combinations of values with sum of 6.

$$P(A) = \frac{A}{\Omega} = \frac{4}{36} = \frac{1}{9}$$