

Problem 1 (5 points): [GH 4.1.17] *Two dice are thrown. What is the probability that the sum of the two dice will be 9?*

Solution: There are thirty-six possible outcomes, which we list.

(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)	(1, 6)
(2, 1)	(2, 2)	(2, 3)	(2, 4)	(2, 5)	(2, 6)
(3, 1)	(3, 2)	(3, 3)	(3, 4)	(3, 5)	(3, 6)
(4, 1)	(4, 2)	(4, 3)	(4, 4)	(4, 5)	(4, 6)
(5, 1)	(5, 2)	(5, 3)	(5, 4)	(5, 5)	(5, 6)
(6, 1)	(6, 2)	(6, 3)	(6, 4)	(6, 5)	(6, 6)

The outcomes that have a sum of 9 are boxed in the table, being (3, 6), (4, 5), (5, 4), and (6, 3). The probability of the sum being 9 is therefore

$$P(\text{sum of 9}) = \frac{4}{36} = \frac{1}{9}.$$

Problem 2 (5 points): [GH 4.2.9] *A coin is tossed two times in a row. What are the odds against getting two heads?*

Solution: There are four equally likely possible outcomes of tossing a coin twice, namely HH , HT , TH , and TT . There is one outcome with two heads and three outcomes not with two heads. The odds against getting two heads are thus 3 to 1.