Q1: Two dices and target=4, what is the probability to win?

Q2: Use SHA256, it 4 leading zeros, what is the probability to win?

Ans:

Q1.

Because target=4, and two dices

So the sum=2,3 => win

2
D1 D2
1 1
-----3
D1 D2
1 2
2 1

Thus the probability to win is 3/36=1/12, fail is 33/36=11/12

Q2.

Because us SHA256 and it 4 leading zeros

So

==> The hash result must be less than this number (i.e., Target):

==> The probability of win is

16^60 / 16^64 = 1/16^4