

Probability Problems Related to the Basic Discrete Distributions

Two fair dice are rolled repeatedly until a total of 7 is rolled. What is the probability distribution of the number of non-7 rolls?

What is the distribution of the number (index) of the roll on which the first total of 7 is obtained?

The two fair dice are rolled repeatedly forever. What is the probability of getting five non-7 rolls before the third 7-total roll?

My team is playing a best-of-seven series. What is the probability that the series goes a full seven games and my team wins the series?

You draw five cards at random from a standard 52-card deck. What is the probability you draw (exactly) two hearts if

- (a) You replace each card after it is drawn and thoroughly shuffle the deck?
- (b) You do not replace each card after it is drawn?

Assume that customers arrive at your business at random times at an average rate of 10 per hour. What is the probability that 10 arrive in one hour? What is the probability that 10 arrive in two hours?