

200 bets, what is the minimum number of wins needed for Marc to make a profit? Find the probability that Marc will make a profit.

b. Another strategy is to bet on the pass line in the dice game of craps. A win pays off with odds of 1:1 and, on any one game, there is a probability of $244/495$ that he will win. Among the 200 bets, what is the minimum number of wins needed for Marc to make a profit? Find the probability that Marc will make a profit.

c. Based on the preceding results, which game is the better “investment”: the roulette game from part (a) or the craps game from part (b)? Why?

26. Overbooking a Boeing 767-300 A Boeing 767-300 aircraft has 213 seats. When someone buys a ticket for a flight, there is a 0.0995 probability that the person will not show up for the flight (based on data from an IBM research paper by Lawrence, Hong, and Cherrier). How many reservations could be accepted for a Boeing 767-300 for there to be at least a 0.95 probability that all reservation holders who show will be accommodated?

Chapter 6 Review

In this chapter we introduced the normal probability distribution—the most important distribution in the study of statistics.

Section 6-2 Section 6-2 introduced the standard normal distribution, which is a normal distribution with these parameters: $\mu = 0$ and $\sigma = 1$. Two extremely important basic procedures are presented in Section 6-2:

1. Given some z score, find an area under the curve representing the graph of the standard normal distribution.
2. Given some area under the curve representing the standard normal distribution, find the corresponding z score.

Section 6-3 In Section 6-3 we extended the methods from Section 6-2 so that we could work with any normal distribution, not just the standard normal distribution. A key element of Section 6-3 is the formula $z = (x - \mu)/\sigma$ that allows us to convert from a nonstandard normal distribution to the standard normal distribution so that we can solve problems such as these:

1. Given that IQ scores are normally distributed with $\mu = 100$ and $\sigma = 15$, find the probability of randomly selecting someone with an IQ above 90.
2. Given that IQ scores are normally distributed with $\mu = 100$ and $\sigma = 15$, find the IQ score separating the bottom 85% from the top 15%.

Section 6-4 In Section 6-4 we introduced the concept of a sampling distribution of a statistic. The sampling distribution of the sample mean is the probability distribution of sample means, with all samples having the same sample size n . The sampling distribution of the sample proportion is the probability distribution of sample proportions, with all samples having the same sample size n . In general, the sampling distribution of any statistic is the probability distribution of that statistic.

Section 6-5 In Section 6-5 we presented the following so that we could address many important problems involving sample means:

1. The distribution of sample means \bar{x} will, as the sample size n increases, approach a normal distribution.
2. The mean of the sample means is the population mean μ .
3. The standard deviation of the sample means is σ/\sqrt{n} .