

1. Two fair dice are rolled.
 - (a) What is the chance of getting a sum of 8?
 - (b) What is the chance of getting an even sum?
 - (c) What is the chance of getting a difference of 3 or -3 ?
 - (d) What is the chance of getting at least one 4? That is, at least one of the dice is a 4?
2. Suppose a professional bowler has a 90% of bowling a strike on each bowl she makes. What is the chance that she will bowl a perfect game, that is, 12 strikes in a row?
3. You figure there is about a 70% chance that you will go to a certain concert. If you buy the ticket in advance it will cost \$30. If you wait and buy it at the door it will cost \$40. Using the concept of expected value, should you buy the ticket in advance?
4. Four cards are randomly drawn from a standard deck of 52 playing cards.
 - (a) What is the chance that all four cards are from the same suit?
 - (b) What is the chance that two are from one suit and two are from another?
5. In “Craps”, a *hard way* 6 bet is a multi-roll bet that 3–3 will come up before 7 **or** an “easy way” 6, that is either 5–1 or 4–2. This bet pays 9 to 1. What is the house edge?
6.
 - (a) What is the chance of rolling exactly 3 sixes in 10 rolls of a fair die?
 - (b) By using the attached table of areas under the standard normal curve, estimate the chance of rolling *at least* 110 sixes in 600 rolls of a fair die?
7. Suppose you start with \$100 and repeatedly bet \$10 on RED in American Roulette. You decide to play until either you lose all your money, or are ahead by \$50.
 - (a) What is the chance you will end up broke?
 - (b) Assuming that each play takes about 2 minutes, about how long can you expect to play?
8.
 - (a) Rosie and Colin decide to play a game with the following pay-off matrix. What are their optimal strategies and what is the value of the game to Rosie?

(b) Repeat your analysis if the entry in row 1 and column 1 is changed from -4 to 4 .