

Math 10B Probability Worksheet 3

1. Suppose that there are two slot machines, one of which pays out 10% of the time and the other pays out 20% of the time. Unfortunately, you have no idea which is which. If you put a quarter into the first slot machine and you don't get a jackpot, what is the chance that it is the one that pays out 20% of the time? If you had instead gotten a jackpot, what would be the chance that it is the one that pays out 20% of the time?
2. Suppose you flip two fair coins. Let A be the event that the first coin is heads, B the event that the second coin is heads and C the event that both coins show the same face. Are A and B independent? A and C ? B and C ? How about A , B , and C ?
3. Show that if A , B , and C are independent events then

$$P(A | B \cap C) = P(A)$$

4. Suppose we roll a fair 6-sided die three times. Let the random variable X be the sum of the rolls. What is $P(X = 4)$? What about $P(X = 8)$? For a challenge, consider the following problem. Imagine that your friend offers to let you roll the three dice and promises to give you as many dollars as the sum of the three dice. How much money should you be willing to pay for this opportunity?