**Worksheet 5 – Chapter 3**

1. Drake Marketing and Promotions has randomly surveyed 200 men who watch professional sports. The men were separated according to their educational level (college degree or not) and whether they preferred the NBA or the NFL. The results of the survey are shown:

|  |  |  |
| --- | --- | --- |
| Sports Preference | College Degree | No College Degree |
| NBA | 40 | 55 |
| NFL | 10 | 95 |

* 1. What is the probability that a randomly selected survey participant prefers the NFL?
  2. What is the probability that a randomly selected survey participant has a college degree and prefers the NBA?
  3. Suppose a survey participant is randomly selected and you are told that he has a college degree. What is the probability that this man prefers the NFL?
  4. Is a survey participant’s preference for the NBA independent of having a college degree? Prove using probabilities.

1. Suppose that there is a 90% chance that a test for performance-enhancing drugs will provide a positive test for an athlete who actually took them. In addition, there is a 15% chance that the same test will provide a positive test for an athlete who did not take them (false positive). Assume that 8% of the athlete population is currently taking performance-enhancing drugs. Create a tree diagram for this situation.
2. The URS construction company has submitted two bids, one to build a large hotel in London and the other to build a commercial office building in New York City. The company believes it has a 40% chance of winning the hotel bid and a 25% chance of winning the office building bid. The company also believes that winning the hotel bid is independent of winning the office bid. (Hint: set up chart or tree diagram to figure sample space)
   1. What is the probability the company will win both contracts?
   2. What is the probability the company will win at least one contract?
   3. What is the probability the company will lose both contracts?