

12.4.1: Probability Using Tree Diagrams (Exercises)

SECTION 12.4 PROBLEM SET: PROBABILITY USING TREE DIAGRAM

Use a tree diagram to solve the following problems.

1. Suppose you have five keys and only one key fits to the lock of a door. What is the probability that you can open the door in at most three tries?	2. A coin is tossed until a head appears. What is the probability that a head will appear in at most three tries?
3. A basketball player has an 80% chance of making a basket on a free throw. If he makes the basket on the first throw, he has a 90% chance of making it on the second. However, if he misses on the first try, there is only a 70% chance he will make it on the second. If he gets two free throws, what is the probability that he will make at least one of them?	4. You are to play three games. In the first game, you draw a card, and you win if the card is a heart. In the second game, you toss two coins, and you win if one head and one tail are shown. In the third game, two dice are rolled and you win if the sum of the dice is 7 or 11. What is the probability that you win all three games? What is the probability that you win exactly two games?
5. John's car is in the garage, and he has to take a bus to get to school. He needs to make all three connections on time to get to his class. If the chance of making the first connection on time is 80%, the second 80%, and the third 70%, what is the chance that John will make it to his class on time?	6. For a real estate exam the probability of a person passing the test on the first try is .70. The probability that a person who fails on the first try will pass on each of the successive attempts is .80. What is the probability that a person passes the test in at most three attempts?
7. On a Christmas tree with lights, if one bulb goes out, the entire string goes out. If there are twelve bulbs on a string, and the probability of any one going out is .04, what is the probability that the string will not go out?	8. The Long Life Light Bulbs claims that the probability that a light bulb will go out when first used is 15%, but if it does not go out on the first use the probability that it will last the first year is 95%, and if it lasts the first year, there is a 90% probability that it will last two years. Find the probability that a new bulb will last 2 years.
9. A die is rolled until an ace (1) shows. What is the probability that an ace will show on the fourth try?	10. If there are four people in a room, what is the probability that no two have the same birthday?
11. Dan forgets to set his alarm 60% of the time. If he hears the alarm, he turns it off and goes back to sleep 20% of the time, and even if he does wake up on time, he is late getting ready 30% of the time. What is the probability that Dan will be late to school?	12. It has been estimated that 20% of the athletes take some type of drugs. A drug test is 90% accurate, that is, the probability of a falsenegative is 10%. Furthermore, for this test the probability of a false-positive is 20%. If an athlete tests positive, what is the probability that he is a drug user?

This page titled [12.4.1: Probability Using Tree Diagrams \(Exercises\)](#) is shared under a [CC BY 4.0](#) license and was authored, remixed, and/or curated by [Rupinder Sekhon and Roberta Bloom](#) via [source content](#) that was edited to the style and standards of the LibreTexts platform.

- **9.4.1: Probability Using Tree Diagrams (Exercises)** by [Rupinder Sekhon and Roberta Bloom](#) is licensed [CC BY 4.0](#). Original source: <https://www.deanza.edu/faculty/bloomroberta/math11/afm3files.html.html>.