

1. Suppose you toss a fair coin three times.
 - (a) What is the probability of observing exactly one head in these three tosses?
 - (b) Given that you have observed at least one head, what is the probability that you observe at least two heads?
 - (c) Without doing much (if any) more math but using mathematical reasoning/probability rules: are observing at least one head and observing at least two heads independent?

2. Suppose during the winter, it snows heavily about $1/8$ of the time. When it snows, an average Middlebury student will come to class on time about with probability $1/2$, will be late $3/8$ of the time, and otherwise will just skip class. If there isn't heavy snow in the winter, an average Middlebury student will come to class on time about with probability $3/4$, will otherwise be late or skip with equal probability.
 - (a) Draw a tree diagram for this problem.
 - (b) What is the probability that the average student is late?
 - (c) If a student skipped class, what is the probability that it snowed heavily?