

DTP-Math-Circle: Session 3—Conditional probability

Sept 30 2022

2 No smoke without fire...

An ancient saying in many cultures expresses the truism: There is no smoke without fire. However, we know from experience that only 1% of fires are dangerous. We also know from experience that smoke is very common due to burning of trash, so there is smoke visible in any neighborhood on 10% of the days. We also know from experience that 90% of dangerous fires produce smoke in the air.

Knowing all this, next time you see smoke in your neighborhood, what will you say is the probability that it is due to a dangerous fire? Formulate your solution in the language of conditional probabilities we have just introduced.