

Example 7 - Multiplication Rule X is undecided as to whether take a French course or a Statistics course. Although she actually prefers Statistics, X estimates that her probability of getting an A in French would be $1/2$ whereas it would be only $1/3$ in Statistics. If X decides to make up her mind based on the flip of a coin what is her chance to get an A in Statistics. What is her chance to get an A ?

Example 8 - Multiplication rule

Suppose an urn contains 8 red marbles and 4 white marbles. Draw 2 marbles from the urn without replacement. What is the probability that both are red?

Example 9 - Multiplication Rule

X is playing on a soccer team. His soccer team has probability 43% to win when they play at home. At home, the team scores twice with probability 35%. The chance of X scoring twice in a game which is won at home is 10%. What is the probability that the team on which X plays wins at home by scoring two goals and both goals are scored by X ?

Example 10 - Multiplication Rule

Suppose that five good and two defective fuses have been mixed up. To find the defective ones, we test them one-by-one, at random and without replacement. What is the probability that we find both of the defective fuses in exactly three tests?

Example 11 - Law of total Probability

An insurance company rents 35% of the cars for its customers from agency I and 65% from agency II. If 8% of the cars of agency I and 5% of the cars of agency II break down during the rental periods, what is the probability that a car rented by this insurance company breaks down?

Example 12 - Law of total Probability

A transport company needs to do safety checking for its cars. Suppose there are only two repair stores in town. One of them is owned by a rival firm and the other is owned by an allied firm so the diagnostics will not be objective. The friendly garage will lie with probability 20% if a car is unsafe and will tell the truth if the car is safe. The “rival” garage with probability 35% will declare a car unsafe even if the car is safe and will always declare the truth if the car is unsafe. Assume that 20% of the company’s cars are actually unsafe and assume that the company will obtain a certificate from each garage for each of its cars. What is the percentage of cases in which the two conclusions are contradictory?

Example 13 - Law of total Probability

Suppose that 80% of the seniors, 70% of the juniors, 50% of the sophomores, and 30% of the freshmen of a college use the campus library frequently. If 30% of all students are freshmen, 25% are sophomores, 25% are juniors and 20 % are seniors, what percent of all students use the library frequently?