

1. Suppose $P(A) + P(B) = 0.9$, $P(A|B) = 0.5$, and $P(B|A) = 0.1$. Calculate $P(A)$.
2. Suppose two cards are drawn successively and without replacement from a standard deck of cards. Calculate the probability of drawing
 - two hearts • a diamond and then a spade • a heart and then a five.
3. Suppose that the genes for eye color for a certain male fruit fly are (red, white) and the genes for eye color for the mating female fruit fly are (red, white). Their offspring receive one gene for eye color from each parent.
 - (a) Define the sample space for the genes of the eye color of the offspring.
 - (b) Suppose each of the four genes for the eye color of the offspring are equally likely. Further, suppose red will dominate the eye color, such that only when the offspring receives (white, white) will they have white eyes. Given that the offspring's eyes are red, what is the probability it has gene (red, red)?
4. In a string of 12 Christmas tree light bulbs, 3 are defective. The bulbs are selected at random and tested, one at a time, until the third defective bulb is found. Compute the probability that the third defective bulb is the
 - third bulb tested • fifth bulb tested • tenth bulb tested.