

1. Draw a picture that best matches the definition of Bayes' Theorem. Use different shadings to highlight the different pieces of the equation.
2. State College is playing Backwater A&M for the conference football championship. If Backwater's first-string quarterback is healthy, A&M has a 75% chance of winning. If they have to start their backup quarterback, their chances of winning drop to 40%. The team physician says that there is a 70% chance that the first-string quarterback will play. What is the probability that Backwater wins the game?
3. A test indicates the presence of a particular disease 90% of the time when the disease is present and the presence of the disease 2% of the time when the disease is not present. If 0.5% of the population has the disease, calculate the conditional probability that a person selected at random has the disease if the test indicates the presence of the disease?
4. A store sells four brands of DVD players. The least expensive brand B_1 accounts for 40% of the sales. The other brands (in order of their price) have the following percentages of sales: B_2 30%, B_3 20%, and B_4 10%. The respective probabilities of needing repair during warranty are 0.10 for B_1 , 0.05 for B_2 , 0.03 for B_3 , and 0.02 for B_4 . A randomly selected customer has a DVD player that needs repair under warranty, what are the four conditional probabilities of brand B_i for $i = 1, 2, 3, 4$?