Section 4.6/4.7 — Example

According to a recent estimate (2007), approximately one million people in the U.S. are HIV positive[1]. The population of the U.S. is approximately 308 million.

No test is perfect, as you know - suppose we do know the following: if you are HIV positive, 95% of the time you will get a positive test result; if you are not HIV positive, 99% of the time you will get a negative test result.

Now, suppose I take the HIV test and I test positive. What is the probability that I actually have the disease, given this positive test?

Guess answer? _____

Solution:

Let H = the event of being HIV positive,
Let T = the event of getting a positive test.

We're looking for $P($ $)$.

We know:

$P(H) =$
$P(H^c) =$
$P($ $) =$
$P($ $) =$

Why the surprising result?

[1] http://www.avert.org/usa-statistics.htm