SECTION 9.2 BAYES THEOREM (flipping the tree)

EXAMPLE 30 A certain virus infects 10% of people
A test used to detect the virus can give a positive result or a negative result.
The test results are positive 80% of the time IF the person has the virus
For people who do not have the virus, the test results are positive 5% of the time ("false positive")

V = event that a person has the virus
Pos = event that the test is positive **Neg** = event that the test is negative

a. Find the probability that a person tests positive and has the virus
b. Find the probability that a person tests positive and does not have the virus
c. Find the probability that a person tests positive
d. Are the events "positive" and "has the virus" independent? Justify using probabilities.
e. Find the probability that a person has the virus if they test positive

SECTION 9.2 BAYES THEOREM (flipping the tree)

EXAMPLE 31: (this example is in section 9.2 of the textbook)

A department store buys 50% of its appliances from Manufacturer A, 30% from Manufacturer B, and 20% from Manufacturer C.

It is estimated that 6% of Manufacturer A's appliances, 5% of Manufacturer B's appliances, and 4% of Manufacturer C's appliances need repair before the warranty expires.

An appliance is chosen at random. If the appliance chosen needed repair before the warranty expired, what is the probability that the appliance was manufactured by Manufacturer A? Manufacturer B? Manufacturer C?