Some Examples #2

Independence Examples:

a) Suppose 10% of all cars have sticky valves, 10% have oil leaks and 1% both. Are sticky valves and oil leaks independent?

b) A box contains two white tickets labeled 1, two black ones labeled 1, one white one labeled 8 and one black one labeled 6. Are drawing a 1 and color black independent? How about drawing an 8 and color?

Reverse Conditioning/Tree Diagram Examples:

a) Serena William at 2004 Wimbledon made (i.e. not a fault) 63% of first serves. When faulted on first, made 93% of second.
   1) P(lose point by double fault)?
   2) P(a fault is second fault of a double fault)?
   3) P(serve is a fault)?

b) Ch 15 #41. Sobriety checkpoints. Officers ask questions, than maybe detain for a breathlyzer test. 12% of drivers nationally drink. Officers have right idea about drinking or not drinking about 80% of the time.
   1) P(someone not drinking is detained for test)?
   2) P(being detained)?
   3) P(someone detained has been drinking)?
   4) P(someone released has been drinking)?

c) Hijacker Profile program. Suppose 90% of hijackers will fit the profile. And 99.95% of non-hijackers will not fit the profile. And one person in 25000 actually is a hijacker. (Maybe carries a weapon?)
   1) P(someone stopped by profile is a hijacker)?
   2) Remark: The 90% number is called the sensitivity of the test and the 99.95% the specificity.

d) Triple blood test for Down Syndrome. Suppose 1 in 800 pregnant women affected. Suppose 8/9 of affected women identified by the test but 1/4 of unaffected women show up as false positives.
   1) P(Down syndrome if test is positive)?