

# Ask Marilyn®

BY MARILYN VOS SAVANT



A particularly interesting and important question today is that of testing for drugs. Suppose it is assumed

that about 5% of the general population uses drugs. You employ a test that is 95% accurate, which we'll say means that if the individual is a user, the test will be positive 95% of the time, and if the individual is a nonuser, the test will be negative 95% of the time. A person is selected at random and given the test. It's positive. What does such a result suggest? Would you conclude that the individual is highly likely to be a drug-user?

—Charles Feinstein, Ph.D.,  
Santa Clara University,  
Santa Clara, Calif.

Given your conditions, once the person has tested positive, you may as well flip a coin to determine whether he or she is a drug-user. The chances are only 50-50. (The assumptions, the makeup of the test group and the true accuracy of the tests themselves are additional considerations.) This is just the sort of common misunderstanding that should give great pause to those who will make the decisions about testing.

9/25/94

PARADE MAG. ASK  
**MARILYN**



I have a really confusing one for you. Let's say my friend puts six playing cards face-down on a table. He tells me that exactly two of them are aces. Then

I get to pick up two of the cards. Which of the following choices is more likely?

- (A) That I'll get one or both of the aces.
- (B) That I'll get no aces.

—Darryl Button, New Orleans, La.

The answer is (A): It's more likely that you'll get one or both of the aces.

Let's say the cards are numbered 1 through 6, with 3 and 4 as the aces. Here are the 15 possible combinations:

- 1 & 2    1 & 3    1 & 4    1 & 5    1 & 6
- 2 & 3    2 & 4    2 & 5    2 & 6
- 3 & 4    3 & 5    3 & 6
- 4 & 5    4 & 6
- 5 & 6

Picking any one of those combinations is as likely as picking any other. Note that 3 or 4 (the aces) appear in nine of the 15 combinations, which is more than half of them. Therefore, it's more likely that you'll get one or both of the aces than no aces at all.