

HW 5.1 Part A pages 293-294 prob 1, 3, 7, 9, 11

① a) If we use a polygraph machine on many, many people who are all telling the truth, about 5% of the time the machine will say that the people are lying (false positive).

b) In my opinion, both can be a serious error. If someone is telling the truth, and machine says they are lying (false positive) this could be very serious if this was a court case situation in which they were trying to be proven innocent. It is also bad if the machine says they are telling the truth (false negative) and the person is actually the criminal.

③ a) If we look at many families where both the husband & wife carry this gene, in about 25% of them the first-born child will develop cystic fibrosis.

b) If the family has 4 children, this constitutes a sample size of 4 which is very small. In order for probability to be closely reflected in the sample, the sample size must be very large.

⑦ In the short run there was a lot of variability in the percentage of free throws made. Over time his percentage both increased somewhat and became less variable as time went on.

9) NO, the tv commentator is incorrectly applying the Law of Large numbers to a small # of at bats for the player.

(11) a) There are 10,000 4 digit #s (0000, 0001, 0002, ..., 9999) and each is equally likely to be chosen, so choosing 2873 or 9999 have the same probability of being selected. (Think of labeling 10,000 slips of paper from 0000 to 9999 and placing in a hat. When randomly drawing any slip, each of the 10,000, including 9999 and 2873, are equally likely to be chosen.)

b) More people might say 2873 is more likely to be chosen than 9999 b/c it looks "more random", they don't "expect" to get same # 4 times in a row. I would choose this kind of # (one that most people would avoid) so I wouldn't have to split my winnings with as many people.