

Math 220: Discrete Mathematics
HW problems mentioned in class

You do not need to submit written solutions for these problems. However, you should solve them as completely as possible.

1. A card trick is performed by a magician and assistant as follows: 5 cards are randomly selected from a standard deck of 52. The assistant looks at them, selects one to give to the audience, and passes the other 4 cards to the magician. The magician looks at the 4 cards and guesses the card held by the audience. How does this trick work?
2. A chest scan is 98% effective at correctly detecting when someone has lung cancer, and 95% effective at correctly detecting when someone does not have lung cancer. Given that 0.12% of the population has lung cancer, what is the probability that someone who got a positive test result actually has cancer? (“Positive” here means that the test says they do have lung cancer. A negative result would mean that no indication of cancer was detected.)