

1. The US Geological Survey says there is a 47% probability that an earthquake of magnitude 7 will occur in the Los Angeles area in the next 30 years. Additionally, there is a 51% probability that a magnitude 7 earthquake will occur in the San Francisco Bay area in the next 30 years.

(<https://www.usgs.gov/faqs/what-probability-earthquake-will-occur-los-angeles-area-san-francisco-bay-area>)

- a. Based on this information, which statements are true?
 - i. A magnitude 7 earthquake will not occur in the Los Angeles area by 2050.
 - ii. A magnitude 7 earthquake might or might not occur in the San Francisco Bay area by 2050.
 - iii. It is more likely that the San Francisco Bay area will experience a magnitude 7 earthquake than it is that the Los Angeles area will.
 - b. Assuming that these are independent probabilities, what is the probability that both the Los Angeles and San Francisco Bay areas will experience magnitude 7 earthquakes by 2050? 0.2397
 - c. Assuming that these are independent probabilities, what is the probability that the Los Angeles area will experience a magnitude 7 earthquake by 2050 but the San Francisco Bay area will not? 0.2303
 - d. Which of the following is most likely to occur?
 - i. **Both** the Los Angeles area and the San Francisco Bay area experience magnitude 7 earthquakes by 2050.
 - ii. **Neither** the Los Angeles area nor the San Francisco Bay area experience magnitude 7 earthquakes by 2050.
 - iii. The Los Angeles area **does** but the San Francisco Bay area **does not** experience magnitude 7 earthquakes by 2050.
 - iv. The Los Angeles area **does not** but the San Francisco Bay area **does** experience magnitude 7 earthquakes by 2050.
2. A standard deck of cards contains 52 cards, divided equally among four suits. The black suits are spades and clubs. The red suits are hearts and diamonds.
- a. If you draw one card from a deck, what is the probability that you draw a red card? 1/2
 - b. If you draw one card from a deck, what is the probability that you draw a spade? 1/4
 - c. 2 friends are playing a game. Each friend picks a card from the deck, looks at it, and then shuffles it back into the deck.
 - i. What is the probability that both friends picked black cards? 1/4
 - ii. What is the probability that the first friend picked a black card and the second friend picked a red card? 1/4
 - iii. What is the probability that the first friend picked a red card and the second friend picked a spade? 1/8