

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?
    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?
    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?
    b. If you draw one card from a deck, what is the probability that you draw a spade?
    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?
        ii. What is the probability that the first friend picked a black card and the second friend picked a red card?
        iii. What is the probability that the first friend picked a red card and the second friend picked a spade?