

Chapter 4 Exercises

Exercise 1: With the assumptions of example 6, calculate the probability of fraud only and the probability of lost cheque only

Exercise 2: Consider an experiment in which two dice are thrown. Write out the following events explicitly:

A: 'the sum of the dice is 7'

B: 'the second die is a 3'

C: 'the difference between the dice is less than 2'.

Calculate $P(A)$, $P(B)$, $P(C)$. Give an explicit description of the events $A \cap B$, $A \cap C$, $B \cup C$ and calculate their respective probabilities, making clear any assumptions you are making.

Exercise 3: On 26 Feb 2008 the Sun published the following article:

"Proud Martin and Kim MacKriell never forget their kids' birthday - because all three were born on the SAME date ... January 29. *Experts calculate the odds of a couple having three children all on the same date are 7.5 in a million.*"

The statement in the article is ambiguous as there are two different scenarios it could refer to:

1. In a family with exactly three children all three have the same birthday
2. Three children from the same family have the same birthday

Calculate the probability of each of these scenarios and then explain why the story is not actually newsworthy.

Exercise 4: Prove that the mean of the Binomial(n,p) distribution is np .

Exercise 5 (A remarkable story?). On 26 Feb 2008 the Sun published the following article:

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