Answers: Conditional probability

Sophie Chowgule

Summary

Answers to questions relating to the guide on conditional probability.

*These are the answers to* [*Questions: Conditional probability*](../questions/qs-conditionalprobability.qmd)*.*

**Please attempt the questions before reading these answers.**

## Q1

#### 1.1.

* (hearts)
* (red cards)
* (red hearts)

Using the definition of conditional probability:

So the probability that the card is a heart, given that it is red, is .

#### 1.2.

You are given:

So the probability that a randomly chosen student plays the piano, given that they are left-handed, is .

#### 1.3.



Using the definition of conditional probability:

So the probability that an employee takes Spanish, given that they take French, is .

#### 1.4.



Using the definition of conditional probability:

So the probability that the student is sixteen, given they bring a packed lunch, is .

## Q2

#### 2.1.



Using the multiplication rule:

So the probability that both sweets are green is .

#### 2.2.



Using the multiplication rule:

So the probability that a box of Bayes Biscuits passes both inspections is .

#### 2.3.

These are independent events, so



Using the multiplication rule:

So the probability of getting heads and rolling a is .

#### 2.4.



Using the multiplication rule:

So the probability that a random person likes both tea and coffee is .

## Q3

#### 3.1.

Given: , ,

Check:

Since , the events are **independent**.

#### 3.2.

Given: ,

Since , events are **independent**.

#### 3.3.

Given: , ,

Check:

Since , the events are **dependent**.

#### 3.4.

Given: ,

Since , the events are **dependent**.

## Version history and licensing

v1.0: initial version created 05/25 by Sophie Chowgule as part of a University of St Andrews VIP project.

[This work is licensed under CC BY-NC-SA 4.0.](https://creativecommons.org/licenses/by-nc-sa/4.0/?ref=chooser-v1)