Your notes

GCSE Maths: revision notes

Conditional probability

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What it means

- **Conditional probability** is the probability of an event, **given** that another event has already happened.
- When you know that B has happened, you only look at the outcomes in B. The total you divide by changes.

From tables and Venn diagrams

- P(A **given** B) = number in both A and B ÷ number in B.
- 40 people wear glasses, and 15 of them are left-handed. **Given** that a person wears glasses, P(left-handed) = 15/40 = 3/8.

From tree diagrams

- On a 'without replacement' tree, the second set of branches is conditional: it depends on what happened first.
- With 3 red and 2 blue counters, P(second is red **given** the first was red) = 2/4 = ½.

The formula

- P(A **given** B) = P(A and B) ÷ P(B). If P(A and B) = 0.12 and P(B) = 0.4, then P(A **given** B) = 0.3.
- If A and B are **independent**, P(A **given** B) = P(A): knowing B makes no difference.

Key terms

Conditional probability	The probability of an event, given that another event has happened.
Given	Already known to have happened.

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Independent	When one event does not change the probability of the other.
P(A and B)	The probability that both A and B happen.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What does 'the probability of A given B' mean?
2. 40 people wear glasses, and 15 of them are left-handed. A person who wears glasses is picked. What is the probability that they are left-handed?
3. P(A and B) = 0.12 and P(B) = 0.4. What is P(A given B)?
4. A bag has 3 red and 2 blue counters. The first counter taken is red and is not replaced. What is the probability that the second is red?
5. A and B are independent. What is P(A given B)?
6. 25 of 60 students take French. 10 of the French students also take Spanish. A French student is picked. What is the probability that they take Spanish?
7. A class has 30 boys and 20 girls. 12 boys and 8 girls wear glasses. A student who wears glasses is picked at random. What is the probability that it is a boy?
8. Why do the probabilities change on the second branches of a 'without replacement' tree?

Answers

1. The probability of A, knowing that B has happened
2. 3/8
3. 0.3
4. 1/2
5. P(A)
6. 2/5
7. 3/5
8. The first item is not put back, so the totals change

What to do next

Practise 12 questions on this topic

Try 6 exam questions, with mark schemes

Read the lesson, one step at a time

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