Conditional probability and independence

Learn and practise | Free preview

A sample from this topic. The complete topic collection contains three different resources and worked solutions.

Read the explanation and worked example. Show your working; use a calculator only where asked.

What you will practise

• Interpret conditioning and compare dependent and independent multi-stage events.

• Explain a method and check the reasonableness of a result.

Useful starting skills: Use the prerequisite operations and representations shown in the worked example.

Conditional probability restricts the sample space: P(A given B)=P(A and B)/P(B), provided P(B)>0. The words given or among identify the new denominator.

Events are independent when knowing one does not change the probability of the other. Without replacement typically creates dependence; tree diagrams track updated probabilities.

Worked example

Among 20 students,8 play music,6 play sport and 3 do both. Find P(music given sport).

Restrict to 6 sport students.

Three also play music.

Answer: 3/6=1/2

Try it yourself

Name: _____ Date: _____

1. A table has 12 cyclists, of whom 3 are late. Find P(late given cyclist).

2. Find P(three heads) in exactly three independent fair coin tosses.

Answers and explanations

Check the method as well as the final answer. An alternative correct method is also valid.

1. 1/4

Condition on the 12 cyclists.

2. 1/8

Multiply three halves.

Curriculum reference: VC2M10P01; VC2M10P02

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