Summary of Tableau 8, Part 1

Conditional probability
Characterising side information in a chance experiment; conditional probability

- Conditioning on the occurrence of an event B of positive probability provides side information about the chance experiment by reducing the sample space to those sample points comprising B.

- The conditional probability of an event A given that an event B of positive probability has occurred:

$$\mathbf{P}(A \mid B) = \frac{\mathbf{P}(A \cap B)}{\mathbf{P}(B)}$$

- The chain rule for conditional probabilities:

$$\mathbf{P}(A \cap B) = \mathbf{P}(A \mid B)\,\mathbf{P}(B)$$

$$\mathbf{P}(A_1 \cap \cdots \cap A_n) = \prod_{j=1}^{n} \mathbf{P}(A_j \mid A_{j+1} \cap \cdots \cap A_n)$$