

Probability and Conditional Probability

counting, two-way tables, and the one question that decides your denominator

What the test actually asks here

- almost every probability question on this test is a counting question wearing a probability coat: find the favourable count, find the right total, divide
- the three shapes that keep coming back are simple probability from a list or a bag, probability read off a two-way table, and a conditional probability where the question hands you extra information first
- the Math section is 44 questions in 70 minutes, so you have about 95 seconds a question on average. A table question that takes you past two minutes is a question you should have flagged and come back to
- there is no negative marking. A blank scores exactly what a wrong answer scores, so every question gets an answer even if it is a guess between two survivors

roughly a quarter of the Math questions are type-your-own-answer, with no options to work backwards from. On those, a probability must be entered as a fraction or a decimal that fits the box, so $9/17$ goes in as the fraction, not as a rounded 0.53

The whole toolkit

one event, equally likely outcomes $P(A) = \frac{\#A}{\#S}$

not A, the fastest move in the chapter $P(\text{not } A) = 1 - P(A)$

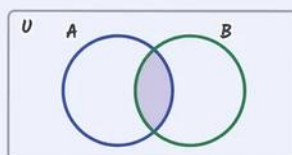
A or B, any two events
 $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

A and B when the two are independent $P(A \text{ and } B) = P(A) \times P(B)$

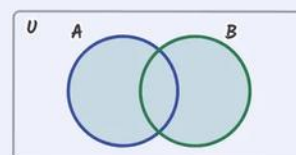
A given B, the conditional $P(A|B) = \frac{P(A \text{ and } B)}{P(B)}$

that last line is the only genuinely new idea here, and on a two-way table it collapses to something simpler still: count the cell, divide by the row or column total the condition names

Or, and, and the overlap *



the shaded lens is A and B, the outcomes counted in BOTH events



A or B is everything inside either circle, shaded at one even wash

adding $P(A)$ and $P(B)$ counts the lens twice, which is the entire reason the or rule subtracts it back once