Section 4-3 Working The Addition Rule (Working With "OR")

Screen 1
In this section we’ll look at the addition rule, which shows up when we want to find probabilities with ‘or’ in them.

We’ll use the following table, which has 100 people in it broken down into categories depending on whether they are men or women, and whether they answered yes or no to a particular question. We can subtotal each row and column to get 40 people answered ‘yes’ while 60 people answered ‘no’, and then we have 43 men in our collection of 57 women. In each case, these rows and columns give us 100 people total.

Here’s our problem. Find the probability that one person randomly selected from this group is a woman, or answered ‘yes’.

To answer this problem we’ll use the addition rule - which says “The probably of event A or event B occurring is equal to the probability of event A plus the possibility of event B minus the probability of events A and B occurring simultaneously.

In terms of this problem we can then write the probability of getting a woman, or a yes, is equal to the probability of getting a woman plus the probability of getting someone who answered yes minus the probability of getting someone that satisfies both of these characteristics - a woman and answering ‘yes’. The probability of choosing a woman at random from the table is the total number of women in the problem divided by the total number of people in the problem… and so that’s equal to 57/100.

Then, the probability of getting someone who answered yes is equal to the number of people who answered yes in the table. That’s 40 over the total number of people. So we get 40/100 for that probability. Then when we look to see how we got those totals of 57 and 40, we see that some people got counted twice, and those are exactly the people that satisfy both characteristics of being a woman and answering yes. So we have to subtract this overlap, and so we subtract off 25/100.

Working this out would get a final answer of 72/100, which equals 0.72 as a probability as a decimal.