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SPEAKERS

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Welcome back, let's follow up on our last video where we looked at the rules of fractions, and let's go through some applications together. We'd like to find the common denominator. So let's look at our first problem right here, take a look at the denominators, we've got a two, a three, and a six. And if I factor completely the denominators, I get only the six has a common factor. And I want to make these two denominators over there look like this one over here. And so what I can do is I'm just going to multiply one half by three over three. Alright, that's just like multiplying something by one. So I'm not breaking any of the rules of algebra, as long as I do the same thing to the numerator that I do to the denominator. And then I want to turn this one over three into a, something over two over three, two times three, excuse me. And so I'm going to take the one over three, I'm going to multiply it by two over two. And now, all the denominators are going to be the same. And I end up with three over six, plus two over six, plus one over six, which is equal to six over six, which is just equal to one.

Now let's look at our next problem. Here, we've got three fractions, we want to add together, if I showed you what their factors of their denominator looked like, it would look something like this. And there's no real similarities, there are no similarities between them, if I want them all to be the same, then I'm gonna have to multiply three by two over two, or the four times five over two, times two, times five, plus, I've got that one over the two times two, it needs to be multiplied by three times five over three times five, plus I've got the one over five. And if we want it to have the same denominator as the others, we're gonna have to multiply it by two, times two, times three over two, times two, times three. Following from the first term here, we've got really, we've got 20 over 60, because two times two times five is equal to 20. And then over here, we've got 15 over 60, whoops, make sure I have my plus sign right there. Plus, we've got two times two times three, that's 12 over 60, again, and the answer is going to be 47 over 60.

Notice that for the two examples, I found the lowest common denominator in each case. In the first example, the common denominator was two and three. And the second one, none of the denominators, none of the values in the denominator had any common factors. So I ended up multiplying each single denominator by the other two denominators. Now let's take a look at an example with a placeholder that's similar to this second example you did where none of the denominators had a common factor. Let's look at the third question. This one right here, between those square brackets. Take a look at the denominators. Notice that there are no common factors, right. There is no B's in A and there's no A's in C. So we're going to do what we did in the second question. We're going to multiply each denominator by the other two denominators. And to do that, we're going to end up with one over A, multiplied by B over B times C over C plus one over B times A over A times C over C, plus one over C times A over A times B over B.

Now I'll do the next I'll find the solution in two parts. So the first part, we're going to have BC over ABC, plus AC over ABC, plus AB over ABC. And of course, since now we've got common denominators, we can add the numerators. So we're going to have BC plus AC plus AB. And since the denominator is common, we can just write this as ABC in the denominator. I hope you noticed that I applied the same rule to a placeholder A or B or C as I would to a number. And that's something that you can do, you just have to make that intellectual leap to applying the same rules you you apply to numbers to letters. Now let's look at some more examples where we're working with placeholder letters instead of numbers.

Here we have some expressions with placeholders, and we're being asked to simplify them. Let's take a look at the top one, the very first, this one right here, I'm going to divide it in a certain way. And notice that we've got an A here, an A here, the exponents differ, we got a B here, a B here, a lonely little C down there. And we also have a five divided by a 15. Let me break this up as follows, we're going to have five divided by 15 multiplied by A squared over A multiplied by B cubed divided by B squared. And essentially, we've got a lonely little C over there, but we could write it as one over C. Now let's use what we saw previously about exponents. Now, you probably realize that five divided by 15, that could be written more simply as one over three, all we have to do is divide the numerator and the denominator by five. So now we've got one over three, A squared divided by A, that's like writing A squared minus one, A to the power of two minus one, multiplied by B cubed minus two, or B to the power of three minus two, multiplied by C, zero to the power of C to the powerof zero minus one, written in the most simple manner possible. Now we've got AB over three C.

Notice what I did in the previous answer. I separated factors in the numerator and denominator in such a way that I never changed the equality. I never changed the answer. I just rearranged the terms in a way that made it clear, hopefully, to you what operations I was performing, what rules I was applying to simplify the result. Now let's try the next question. So if I look at the numerator, I can see that there's common factors, we've got a two in both terms in the numerator, and we have an A one A to the power of one. So let me factor out 2A and I'll rewrite the numerator as follows. 2A multiplied by A plus B in a bracket together. Now looking at the denominator, we have A squared minus B squared. The only way to solve this is to remember one of those very important factor and identities. And that identity tells us that if we have something like A squared minus B squared, we can rewrite it as A minus B multiplied by A plus B. Now when we're looking at this, we can see that we've got a common factor in both the numerator and denominator and it's this A plus B. So we could, cancels those out and rewrite this as A, or excuse me, two A over A minus B.