Alexis: Hi, everyone. Alexis Avila, of Prepped and Polished LLC., here at South Natick, Massachusetts. On the ACT math section, it's easy to make careless mistakes if you're not careful. My friend and special guest Dabral, from ACTQuantum.com, based in California, going to explain to you a typical problem students often miss on the ACT math section involving exponents. Dabral, take it away.

Dabral: So, here, I want to give you an example of a common type of exponent problem that shows up on the ACT and, sort of, the temptations that students have in terms of simplifying it. So, I'll start with this first piece here, two X cubed to the power of four. And so, here, we are raising each of these components to the fourth power. So, this is equivalent to two to the four times X cubed to the fourth. And here, two to the four, that's just 16 and, to understand this really means I'm going to multiply X cubed four times. And that is equivalent to having a set of 12 X's. So, this is really the same as X to the twelfth, or in other words, so, we're just adding the exponents.

So, the rule when you have - this is what's called power of power - is that you multiply. So, this is X to the power of three times four, not X to the seven. Common mistake in terms of adding those. So, that expression is 16 times X to the 12. And, also, the rule that I used here where I distributed that exponent comes from if you have two numbers raised to the power of M. This is A to the power of M times B to the power of M. Because, really, this means that we have M of these expressions and collectively, that means, 'cause it's multiplication, we can change the order. that we have MA's and MB's. So, that's what we're doing here. Now, if we look at the second piece of this is two X four to the third. That, again, we do the same thing. Two cubed times X four to the third. Now, that is eight. Then, again, we get, here in this case, X to the 12.

Now, if you go back to the original expression, it's made of some of those two terms. So, we're looking at 16 times X to the 12 plus eight times X to the 12. Now, again, here, a common temptation would be this is 24 times X to the 24. None of that applies. You can't just add these exponents. In fact, a better way to think about this is to factor X to the 12 and then this becomes 24 times X to the 12. I think a common temptation for these types of exponent problems is if you're given X to the ten plus X to the ten, that's not X to the 20. Instead, think of factoring X to the ten, in this case, this would be just two times X to the ten. Or, another type of example, is X to the ten plus X to the eleventh. It's best to handle it by factoring X to the ten. And you can't really just add this and say this is equal to X to the 21. So watch out for those temptations.

And then, just to summarize, sort of, the operation we did here, is that we have X cubed to the four is same as X four to the third. So, here, really, it doesn't matter where the

exponent is. And this is equal to X to the 12, not equal to X to the seven. That's the common one you want to watch out for. And to summarize here, this original expression we started is equivalent to 24 times X to the 12, which is answer choice D.

Alexis: Thank you, Dabral. That was really helpful. If you have any further questions, you can email me at Alexis@PreppedandPolished.com and also be sure to visit my friend Dabral's site. Has wonderful explanations to ACT problems. That's www.ACTQuantum.com. Good luck on your ACT test and I'll talk to you soon.