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SPEAKERS

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Hi everyone, welcome back. We've got another great video today we're going to look at algebraic expressions, we're gonna go over some definitions, these definitions are going to help you communicate your questions to tutors, to instructors, to employers possibly. And so these definitions are going to be important to you. And they're gonna help you understand also the algebra on the mathematics that we're trying to get across to you. After that, we're going to look at some very important quadratic identities. And we're going to use what we talked about in the last video, which is that FOIL first outside inside last. So I hope you're ready. Let's go. Let's go over some notation together. So some notation and definitions. Now, let's start with what is an algebraic expression?

Well, an example of an algebraic expression would be something like 2x squared plus 3y squared minus X squared. And if we look at this algebraic expression, we can see a few things one is that there are three terms. So, this is the first term 2X squared is the first term, 3y squared is the second term and X squared is the third term. So there are three terms. A term is separated by a addition or subtraction sign. Multiplication within a term is allowed, that's okay. But plus and minus is not allowed within the term that would require them being separate terms. Now looking at the term itself, suppose we take a closer look at 2x square. Well, the square is known as the power or the exponent, the X, which is an unknown variable in this case, but more generally, it's referred to as the base and X squared is being multiplied by 2, that 2 is known as the coefficient. Now we can say that if two terms have the same base and power, then I should say they are like terms. And we can add or subtract their coefficients

Let's consider an example. So we'll write 2x squared plus 4x minus X squared plus 4. Now in order to have a like term, they have to have the same base and the same power. And so we've got a 2x squared here and a 2x squared here, so these are going to be the same. We've got essentially here, this 4 you can imagine that there's an X to the power of zero there, and X to the power of zero of course is just equal to one. So it does not have the same base and power as for X, or X squared. And so we could rewrite this expression as 2x squared minus X squared plus 4x plus 4, and we can subtract this expression here, of course, we've got, you can imagine that we've got a one in there a

1x squared, it's organic with X square plus 4x plus 4. Quadratic expressions are really useful in Business and Economics because they can help us model simple relationships, for example, the relationship between a firm's profits and how much output it produces.

What is a quadratic expression? Well you can see on the slides in front of you that the definition of a quadratic expression is one where there is no variable of a higher power or higher exponent than two. Now there are three very important quadratic identities that you're going to want to memorize. And we're going to walk through each of them together right now. So here are the three, let's focus on number one first. So very often, we'll have in brackets A plus B, or two terms that are squared. And remember that this is equal to A plus B times A plus B. And, as we saw, earlier, in previous videos, we're going to want to use FOIL to find the answer. But better than using FOIL with this one is you just want to memorize that the answer to this thing is A squared plus 2AB plus B squared. And if you use FOIL, you'll see that that's true. Similarly, we could use FOIL on number two. We know that we're multiplying A minus oops, A minus B times itself. And that's going to give us A squared minus 2AB plus B squared.

The last one is my favorite. You could use FOIL to figure out what it is. But it's very important to memorize this one, because often you'll see it written as a squared minus b squared. And it's a really useful one that comes up fairly frequently. Sometimes you'll see this, and you'll want to know that it's actually equal to the left hand side here, this A plus B in brackets, multiplied by A minus B in brackets. Let's cover negative parentheses and just make sure that you know how to deal with them. So here is the practice problem we've got, you can see we have 4 minus 3 plus 5 minus 2, and they're all in a bracket together, but there's this negative sign on the outside. So how are you going to deal with it? Well, one way to rewrite this as you could see this as negative 1, times 4 minus 3, plus 5, minus 2. And if you've wanted to, you can put a plus right there. And remember our rule A, B plus C is going to be equal to AB plus AC. And so this answer, we're just going to essentially change the signs of every number within the brackets. And so we're going to get negative 4 plus 3 minus 5 plus 2, and that's going to give us negative 4. Of course, you could also have used BEDMAS, and you should get the same answer. That's it for quadratic expressions. Remember those three quadratic identities and I'll see in the next video, bye bye