Hi, my name is Anthony Varela. And in this tutorial, we're going to solve problems involving percents. So we're going to look at an example with sales tax. Then, we'll look at an example where we want to find a unit price with sales tax. And then, we'll look at an example with a percent discount.

So let's say we're going to the store to buy a $300 TV. Well, of course, we know that that's not going to cost exactly $300. There's going to be some tax applied. So looking at our receipt, we see our subtotal of $300, the price of the TV. And if the sales tax is 7%, that means we're paying an extra $21 to tax. So our total due then would be $321.

So thinking more about that 7% tax rate, that can be written as 0.07, in decimal form. And the reason why we like to write this in decimal form is that we can multiply this then by the $300 TV to find out how much we pay for tax. So $300 multiplied by 0.07 is $21.00. $21 represents just the amount due to tax.

Now, we can multiply $300 by 1 plus 0.07 to get our total due. So we can think of, once again, 0.07 is the 7% tax. We can think of 1 as being 100% of the $300 price tag. So when we add 100% and 7%, that's 1 plus 0.07, which we can multiply by $300 to get our total due of 321.

So when we're talking about percent tax, we can express our rate of tax as a decimal. Let's call that r. So if we multiply p times r, that would be price times the tax rate, multiplying p times r is going to give us just the amount for tax. But if we multiply p by 1 plus r, that's going to give us our price with the tax.

So let's apply this to a scenario. So a company buys 60 t-shirts for their staff. And the total cost, which includes a 6% sales tax, is $1,526.40. So we want to know what is the price of each shirt before taxes. So let's go ahead and assign that a variable. The price of each shirt is going to be x.

So we'd like to then develop an equation that involves x, which we can solve for. So we want to buy 60 t-shirts. So 60x would be, then, the cost for 60 t-shirts. But we know that we need to include tax. So this price for 60 shirts, including tax, we're going to multiply 1.06.

Remember, we're including the 60 t-shirts and then the 6% tax. So that's how we can figure in our sales tax. And we know that this all comes together then to $1,526.40, the total cost. So this is the equation that we need to solve for. So first, let's multiply 1.06 by 60. So we get $1,526.40 equals 63.6x.

And one thing that I find helpful in solving these problems is what this statement here says is that when you buy 60 t-shirts with tax, it's almost like you're buying 63.6 shirts. So now, we can divide both sides by 63.6. And we get that 24 equals x. And remember, x is the price for each shirt. So it's $24 per shirt.

Well, now, let's talk about discounts. So a problem involving discounts. So the t-shirt distributor offers a discount for large company orders. So now that we know we get a discount, we want to actually buy 70 shirts. So the total amount due for 70 shirts is $1,513.68.

Now, this price includes 6% tax and it includes a percent discount that we don't know. So what is the percent discount? Well let's start off by calculating or total due, just knowing that it;s $24 for one t-shirt. So we're going to multiply 70 by 24. So $1,680 is the price for 70 t-shirts. And this is no tax applied and no discount applied.

So if you wanted to figure in then the 6% tax, we can multiply this by 1.06. So we know that it's going to cost $1,780.80. But this is no discount. So let's compare, then, these two prices, the $1,780.80, which is no discount, and $1,513.68, with a discount.

And this is the equation that I like to use for discounts and markups. So we're going to take our final total due, subtract the original. Then, we'll divide by that original cost. Then, we can multiply it by 100 to go from a decimal into a percent. And then, when you take a look, if that number is a negative number, it represents a discount, so the price it going down. If that is a positive number, that represents a markup that the price has increased.

So this is what we're going to use. So let's first take $1,513.68 and subtract $1,780.80. So this equals negative $267.12. So this means I'm saving $267.12. I'm going to take that savings and divide it by my original cost with no discount, which is that $1,780.80.

So doing that division, then, I get a decimal number of negative 0.15. And so I can multiply that by 100 to get a percent. And because it's a negative number, this represents a 15% discount. So I've saved 15% on the t-shirts through this large company order.

So let's review solving problems involving percents. We talked about percent tax. And we can express that tax rate as a decimal. And when we multiply that by the price, we get the tax. If we add 1 and then multiply by the price, we get the price with tax.

And then, we looked at discounts or markups. We can take the final cost, subtract the original, divide

by that original, and I forget to write in the multiplying by 100 that's to go from a decimal to a percent. But the important thing is that if it's a negative number, it's a discount. If it's a positive number, it's a markup. Thanks for watching this tutorial on problems involving percents. Hope to see you next time.