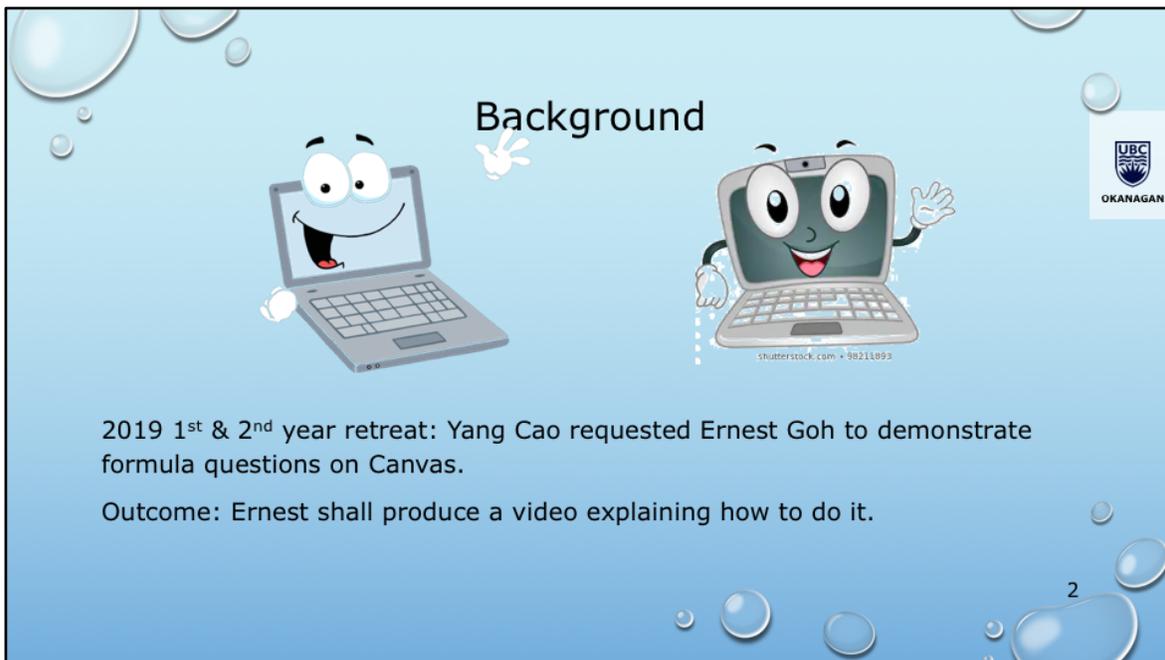


# How to Set Up Formula Questions on Canvas

By Ernest Goh





The slide features a light blue background with several white bubbles of varying sizes. In the center, the word "Background" is written in a black, sans-serif font. To the left of the text is a cartoon laptop with a smiling face, large eyes, and a wide grin, waving its right hand. To the right of the text is another cartoon laptop with a similar face, waving its left hand. In the top right corner, there is a small logo for UBC Okanagan, consisting of a shield with a tree and the text "UBC OKANAGAN" below it. At the bottom right of the slide, the number "2" is visible.

2019 1<sup>st</sup> & 2<sup>nd</sup> year retreat: Yang Cao requested Ernest Goh to demonstrate formula questions on Canvas.

Outcome: Ernest shall produce a video explaining how to do it.

A very good day to all of you viewers! My name is Donald, a computer generated voice from natural readers dot com.

and my name is Felicia, also a computer generated voice from natural readers.

In this video, we shall explain how to set up formula questions on Canvas.

In the recent twenty nineteen first and second year retreat, Yang Chao requested Ernest Goh to demonstrate the use of formula driven questions on Canvas. This video is the outcome.

## Background

What are formula questions?

Questions with one or more numerical values, randomisable.

Correct answer is generated by a formula.

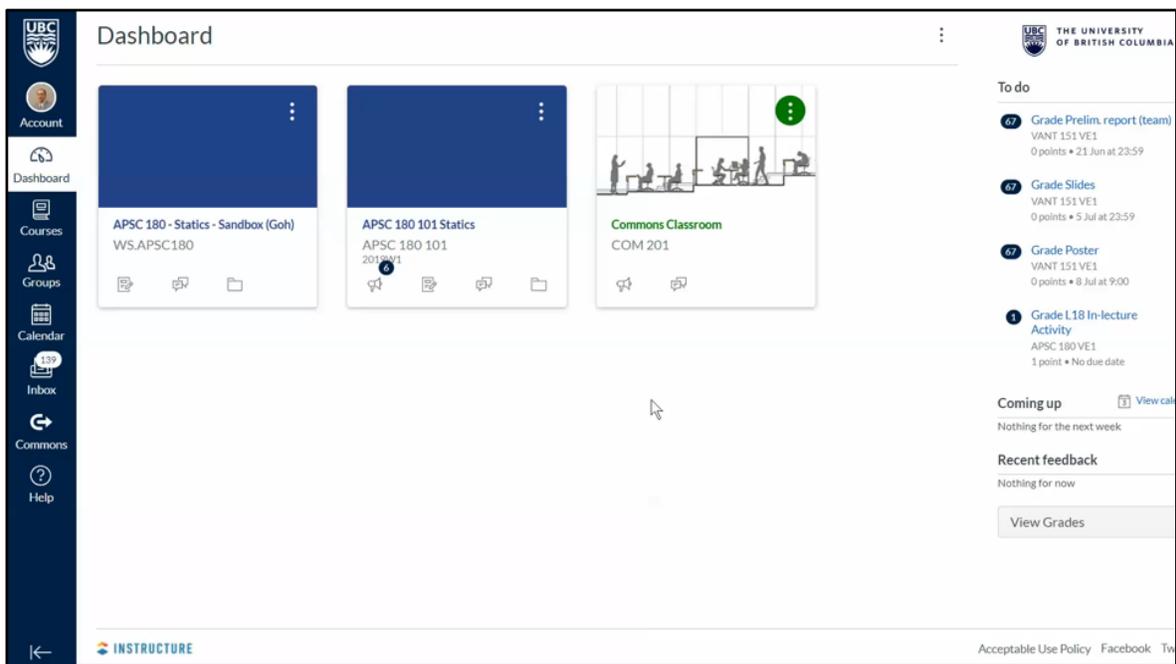
What is  $5 + 5$  ?



What are formula questions?

They are questions in which there are one or more numerical values, and students use these values to calculate an answer. The values are randomised. So the correct answer is not a fixed value, but a number produced by a formula. Hence the name formula question.

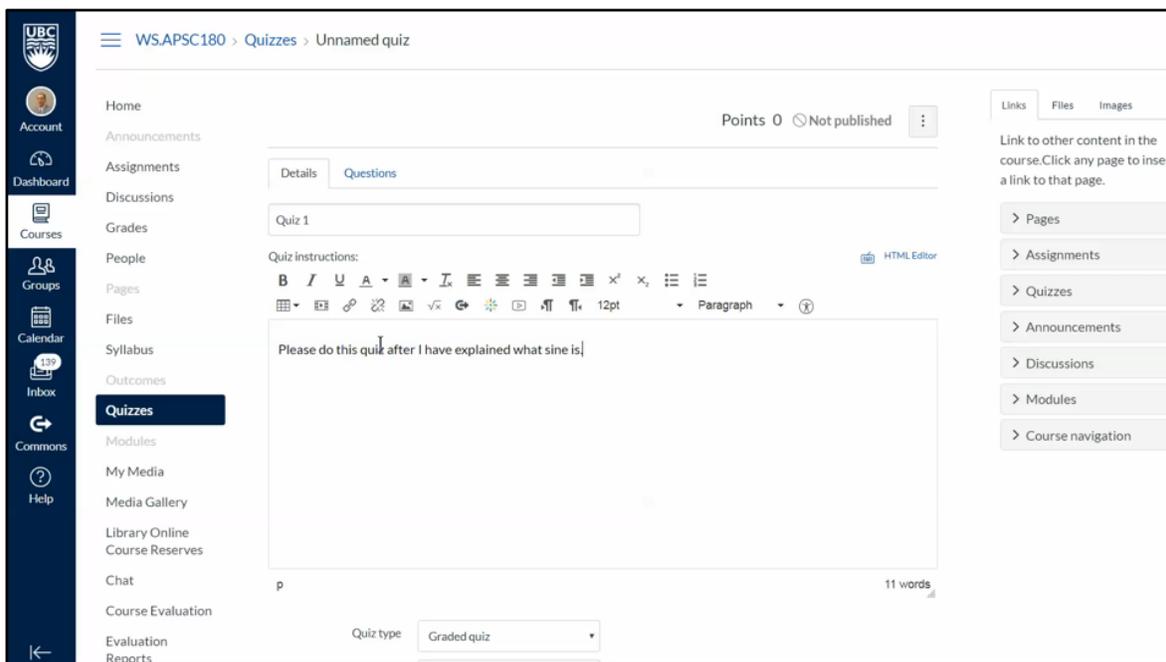
Ernest has been using such questions for in-class activities in his engineering mechanics courses. He solves an example under the document camera. The numerical values in his example are usually taken from the printed version of the textbook. After that, students work on the same example, but with different numerical values. It is hoped that this encourages students to participate actively in class.



Here is how to create formula questions. Open your course in Canvas. On the left panel Click quizzes.

On the quiz page, click the add quiz button on the top right corner. On the page for creating a new quiz, type in a name for this new quiz.

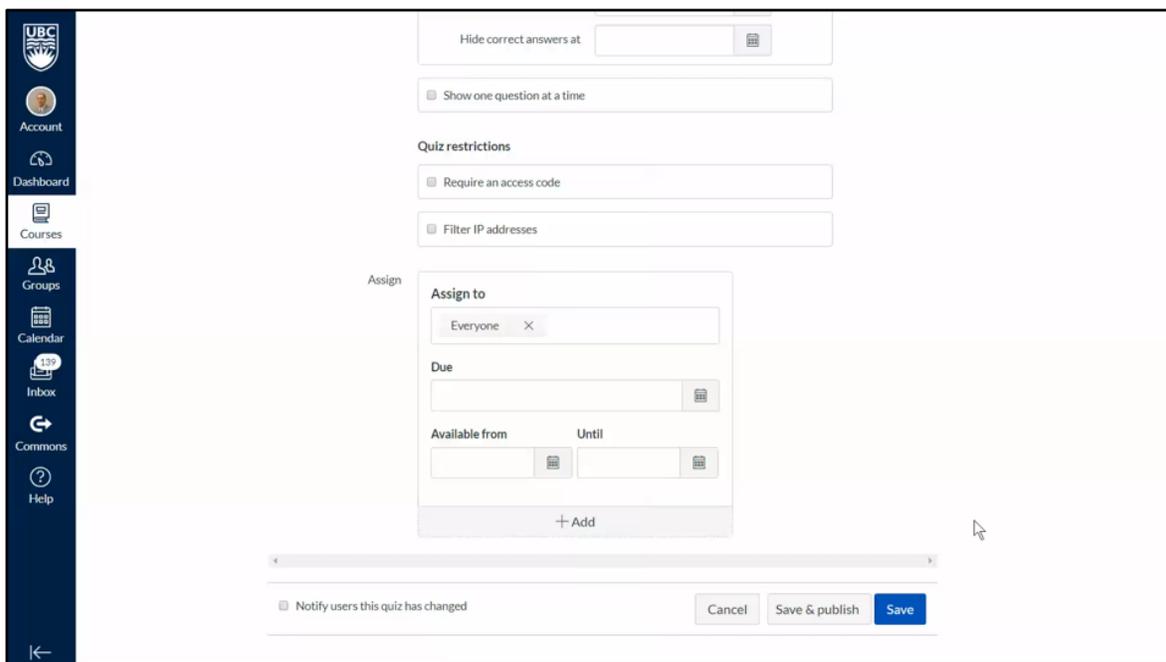
Fill in the general instructions for the quiz, applicable for all questions in the quiz.



Set the various quiz options such as quiz type and assignment group.

For in class activities, Ernest usually allows multiple attempts. Which score to retain and number of attempts can also be set.

Set other options such as viewing of correct answers, access control, the date range that the quiz is available to a particular section. Click the add button at the bottom to make the quiz available to another section with a different date range.



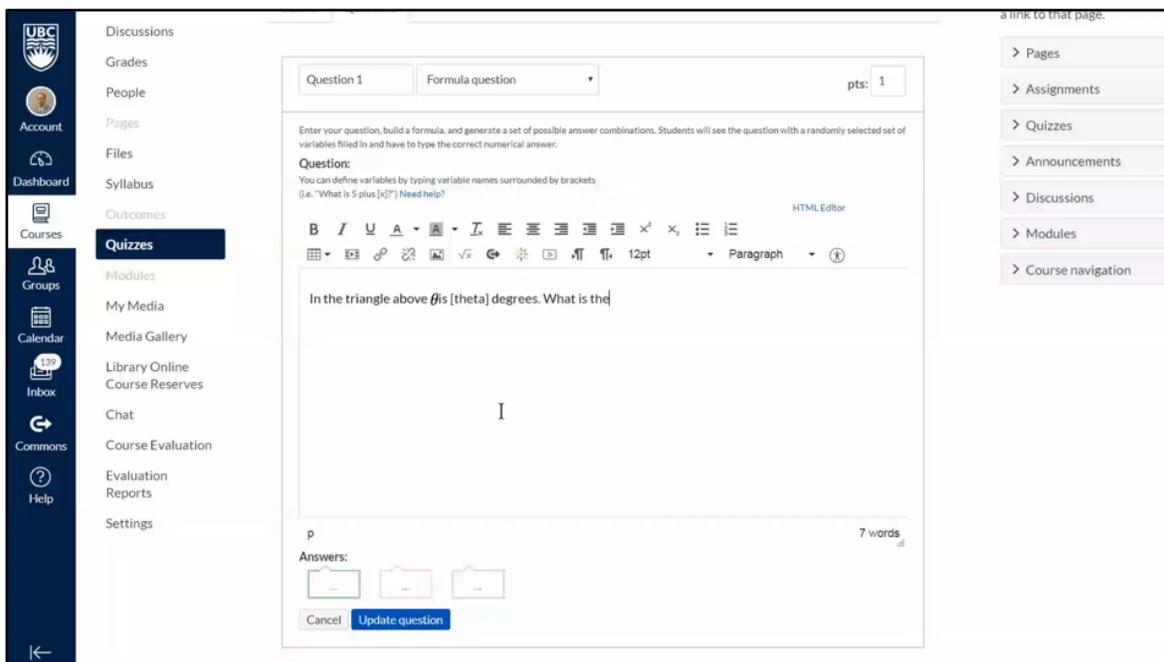
With the options set, scroll up to the top of the quiz. Here, click the Questions tab. Then click the add new question button. Give it a question number.

Next to the question number is a drop down list of the type of questions. Scroll down until you see formula questions, and select it. Type in the question text in the main box. As you can see, you may insert math expressions.

To insert a randomisable numerical value in the question, put a variable name in square brackets. As shown here, theta is the randomisable variable.

You may also insert figures in the question. Ernest has previously uploaded a picture onto the files area of the course. So it is just a matter of selecting it from the right panel.

If the size doesn't look right, highlight the figure and click the embed image button to bring up the dialog box for changing the size.



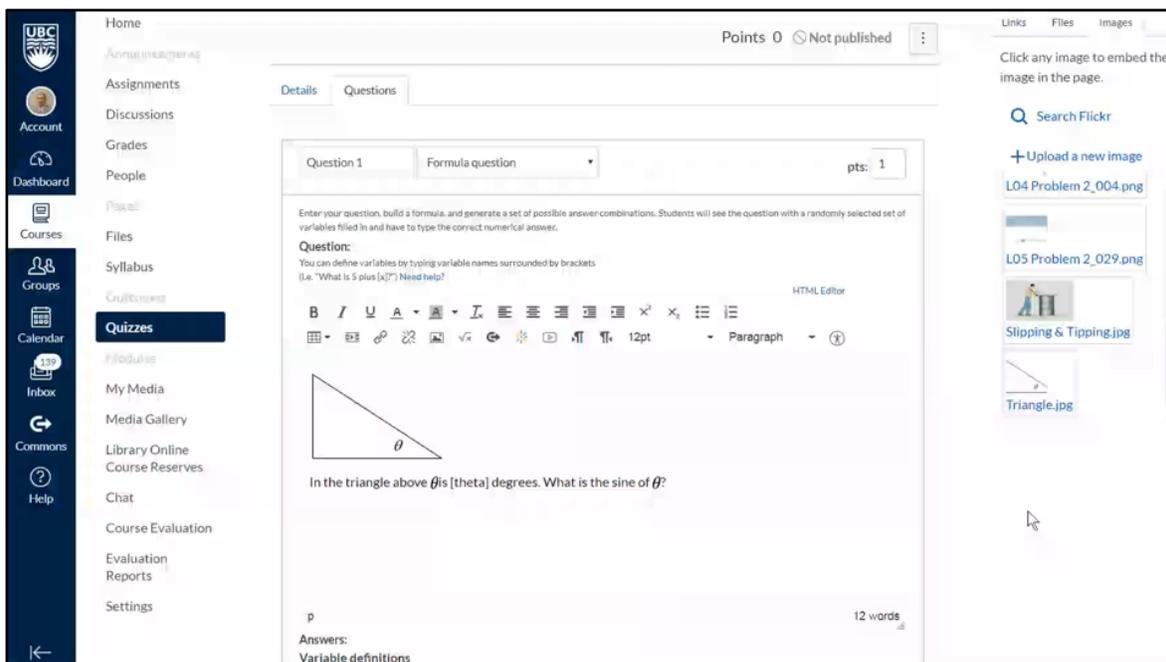
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Scroll down. For each variable in square brackets, a row for it will appear in the variable definition area. Enter the range of values for the variable and the number of decimal places.

The answer for the question is defined by a formula. If you are not sure of the syntax, scroll up to the need help link and click it. Click the functions tab.

Select the list for functions to see what is available. Let's intuitively look for sine. Yes, it is available in the usual abbreviation. Click it to look at the syntax.

The box at the bottom tells us that it accepts an argument in radians.

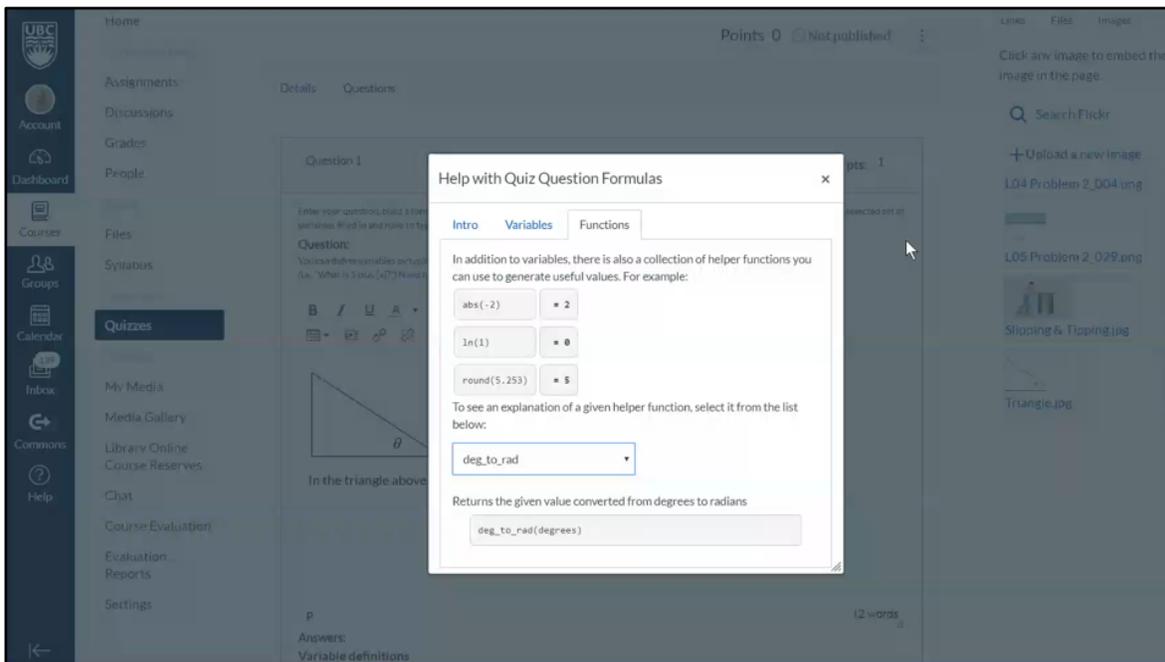
Going back up to the list of functions, we see that radians to degrees and vice versa are available. Let's look at the syntax. It's quite straightforward.

Let's close the help dialog box and enter the formula. Here, the argument of the degrees to radians function is the variable theta.

For very complex formulae, Ernest recommends that you copy it onto notepad so that

you don't have to re-type everything in full just to correct a minor mistake.

Click the save button and the answer will be computed using the example value above. Right now it is showing zero because we have not set sufficient number of decimal places. Change it to four, and the correct result appears. Try a few different values by clicking the re-compute button.



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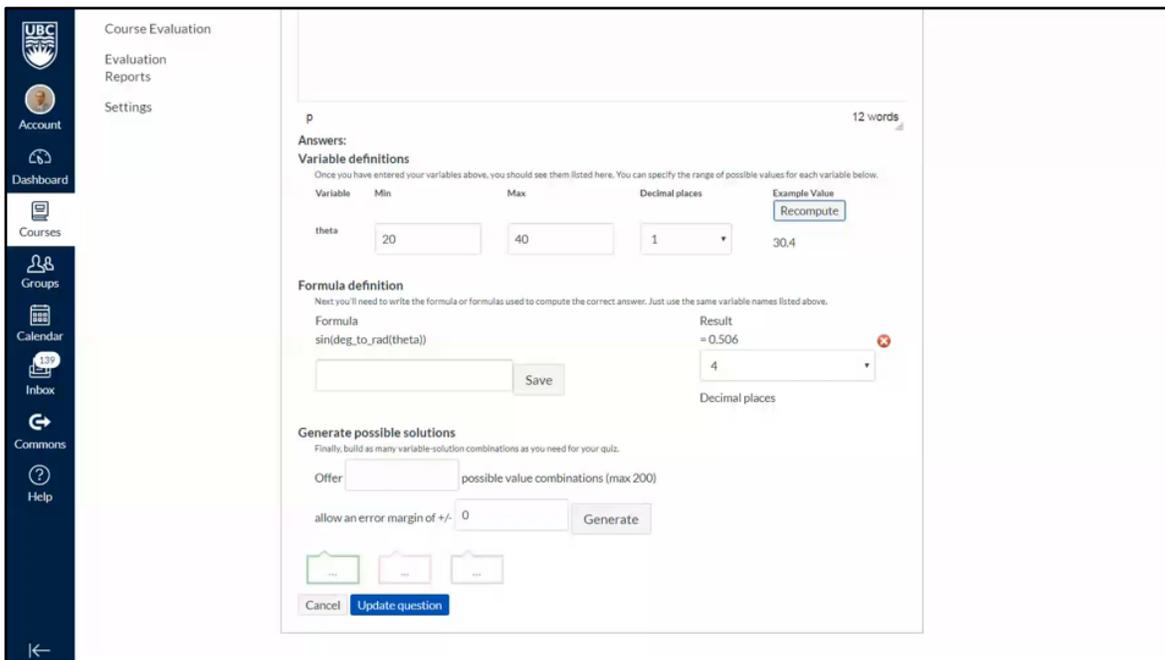
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Let's check the correctness of our formula. Using the Windows calculator, we find that the sine of 30.4 degrees is indeed 0.506.

Now, generate up to 200 different questions. Here let's try just 10, to reduce calculation time. Set a desired error margin and click the generate button.

So now we have 10 different questions. If you are satisfied with the values, remember to click update question. This closes the question and we are taken to the main page of the quiz. You may add more questions, or save the quiz to exit quiz editing.

Let's go back to the quizzes section. Scrolling down, we see that quiz 1 has been created. Click it for a preview.

Here we are shown one of the variations of the question, asking for the sine of 21.9 degrees. Let's open the calculator and find the answer.

We put in the answer, click submit and scroll down to the bottom.

And we got it right!

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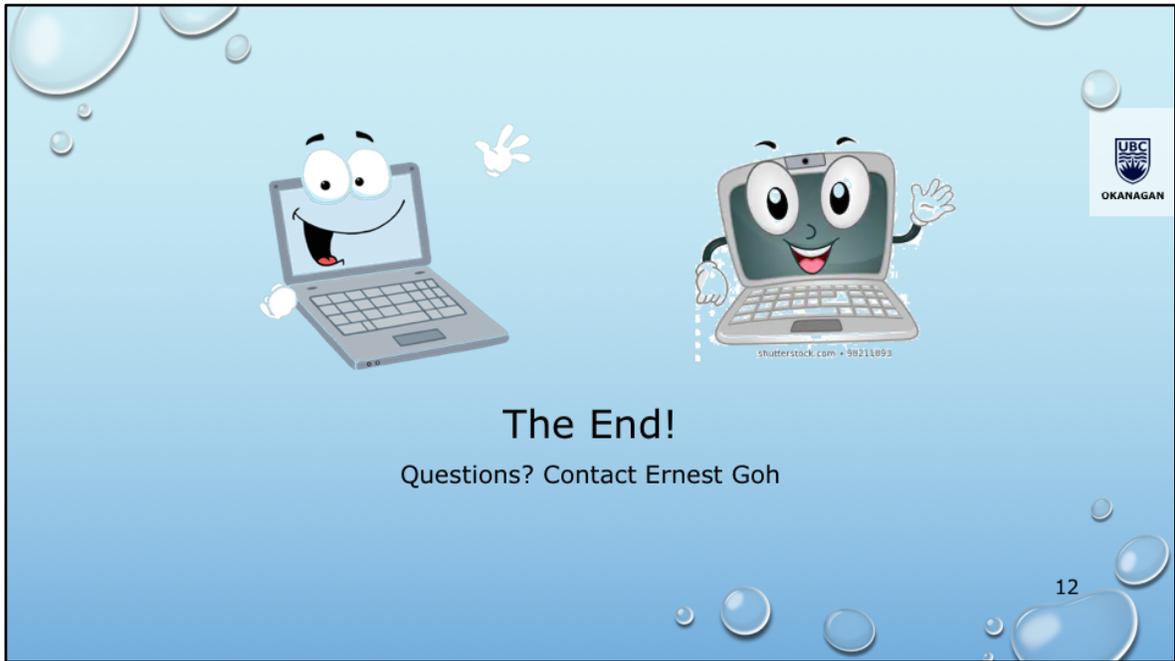
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That was a video on how to create formula questions on Canvas.

If you have any questions, feel free to contact Ernest.

Have a good day!

