In this video I will discuss how I have developed component two of the application task.

The second component will have outcome two, weighing more than outcomes one and three. I need to ensure that I have considered general features of the context involved, extending, and generalisation, formulation and application introduced in the first component, so that context is explored in greater breadth and/or depth. It is a component which will, typically, include more open-ended work, with some unfamiliar and non-routine aspects considered.

So I've brought in integration by parts. Although we have not talked integration by parts in class. However, I have given the first question as a show question, as you can see in the slide here. Actually this one here is a little bit more... Ah yeah, that was a show question. So students can actually find the derivative using a product rule and rearrange it to show that the integration of u v' dx is equal to u times v take away the integration of v u' dx. So, indeed, this one here is the integration by part. And students will use this formula to determine the integrals of I1, I2, I3, for example.

Okay, so and then students can ask to explore the reduction formula and use it to find I5. In part d, students were asked to describe the graph of In for small values of n. I will leave it up to the students to decide the small values of n. This is where high level achievement students will go above and beyond and perhaps trying to generalise the graph after they have seen how changing the n value would change the integration.

The next slide here is some possible other questions. So, for example, in this one, I give students a number of different functions, as you can see on the slide. I gave sin, cos, and also log of kx. And then students then choose suitable value of k and combine the function f with any other function to form a product of two functions. Then construct a reduction formula for the integral of the product of two functions and use these to find In for n greater than/equals to four.

So, you can see in this particular one, it can actually go much further. It's open. Leave it up to students whether they just decide to choose one set of values, so one set of product, like f with g, something that they're familiar with in component one. Or, they could actually just go a bit more than that. f is x to the n and combine it with sin or cos, et cetera.

So you can see there are four choices in this alternative question. Some students, as I mentioned, might stick to what they have explored previously and that is to combine f with g. Other students might decide to go further, not only combining f with g, they also want to explore f with h. It depends on the amount of time they have, they might want to explore each of them.

I can also extend by asking students to investigate their own function. And this could be a function to the power of n or a product of any two functions that they can think of. Investigate, it might work, it might not work at all. Deduce the reduction formula and use it to find I2, I3, and eventually getting to find I5, for example.

So, similar to component one, this slide is an example of how I map the content by topic. We've got one from the study design. So in this one here the topic, anti-differentiation and integration. I have some dot points there. Try to map out what I would like to test in this, or assess, in this component two.

So, it comes to this is the end of my discussion for developing component two. In my next video, I will discuss how I have developed component three, the last part of the application task.

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