Welcome to Video 5 of Mathematical Methods Modelling or Problem-Solving Task for Unit 4. We are told in Unit 4 that one of the problem-solving tasks needs to be probability and that's what this task is about. Video 5 deals with the assessment.

Now we know that our assessment, because these tasks can't look like an exam, the assessment needs to be according to a rubric, and it needs to be a separate document that you share with your students rather than marks on the paper.

And following the outcomes for this probability task, for Outcome 1, could you see on this table, we have seven marks. For Outcome 2 we have 10 marks, and for Outcome 3, we have eight marks. In brief, in clear words, we can say that Outcome 1 is skills, and that's where your scaffolding is, so that we can actually scaffold the task with some skills questions and introduce the students to the concept. Outcome 2 is where we generalise, we try to solve the problem, we think about the problem and we think about a new problem that we could ask. And so that's why it's worth 10 marks. It's worth more marks, and this is where our open-ended questions sit. And then Outcome 3 is technology, where we assume technology for all of the task, and that's worth eight marks.

So this particular SAC that I've talked about in the previous parts, have three parts in them. And Outcome 1, I've put three marks for Part 1, because at the beginning it is setting up the skills. Whereas can you see in Outcome 2, I've put four marks in Part 2, because Part 2 is where the students have to really think, where they have to look at a discrete graph and put a normal distribution on the top of it. So that requires some thinking, and some open-ended questions. And Outcome 3 is requiring the use of the student's calculators, which is used fairly evenly throughout the task.

Outcome 1, is where we look at, as I said, the skills or the scaffolding of the question, and we look at the different criteria where we are told what marks we have to apply. So Criterion 1 is appropriate use of mathematical conventions and symbols. So obviously that comes up in the beginning of the task, where the students actually look at the graphs of the normal distribution and key features of the graphs. And Criterion 2 is definition and explanation of key concepts. And that looks at area and symmetry, and it looks at the normal distribution and the binomial distribution. Criterion 3 is use of skills and techniques to find the area under a normal curve or transformations are skills that the students can do.

Outcome 2 is the deeper work. So Criterion 1 is identification of important information. So the important information is we're looking at the normal curve. Then we're looking at how we can approximate the normal curve to discrete data of the heights of a certain population of students. Criterion 2 is the application of the ideas. So we're looking at formulations of probability concepts and mathematical content, and specifically the normal distribution and the binomial distribution.

And Criterion 3, and this is where our open-ended questions are analysis and interpretation of results. Can we draw conclusions from these graphs and these investigations. And the alternative ending that I put with can the students make up a conditional probability question themselves. That's where can they make it up themselves and draw conclusions about their problem of heights for the students. And also students can vary parameters for the binomial, they can vary n and p, and for the normal distribution they can vary the mean and the standard deviation. And what does that do to the graphs.

Outcome 3 is technology. So for technology, it's only useful to the students if they know when to select it and what menus to use. Which means students need a lot of practice in doing it beforehand. So appropriate selection, can they make a selection that's relevant? And can they use the technology for the question they're looking at? Can they sketch graphs on their calculator? And can they make a suitable choice of a CAS menu? In other words, can they look at the normal distribution or the binomial distribution and binomial. Are they looking for cumulative or just one data, or are they sketching a graph? Or they can use statistics for a confidence interval.

Then the application of technology we've got quite a lot in this SAC. They look at the relationship between the graphical and symbolic forms about the functions and the corresponding features. We use distributions to evaluate the probability on our calculator. We use technology to sketch the distributions and we use technology to evaluate and interpret confidence intervals. So this outcome being technology is significant for the students, they don't know how to use this in a SAC, unless they've had plenty of practice beforehand of which menu to select, and which is the quickest and more elegant to use. So Outcome 3 is eight marks.

When you're setting up a rubric for your students the sample assessment record, which is on the VCAA website is a good place to start. You can actually use this sample assessment record as is, or you can use it to make it a little bit detailed to suit your task. So in other words, accurate use of mathematical skills and techniques. You might want to write exactly what that is in relationship to your task. To make it relevant to your task and relevant to you and the students when you've marked it.

So this sample assessment record is a good place to start. As I said, you can use it as it is, or you can make it a little bit detailed yourselves. And can you see those marks of seven, ten, and eight are there for Outcomes 1, 2, and 3. I find it's helpful that once you've set up a rubric, that you actually show the students before the SAC. So they've actually got an idea of what their task is being assessed on.

A set of sample tasks is provided in Advice for teachers. So we have sample tasks for Maths Methods or Specialist Maths, and for Further Maths. And the task in this video has been included in the sample tasks. So this is the end of this task, thank you.

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