**Mathematics Extension 2 Vectors Q10-transcript**

(Duration 3 minute 37 seconds)

This is the HSC hub Mathematics curriculum support for the New South Wales Department of Education. My name is Jackie Blue. This video provides a solution to multiple choice question 10 from NESA sample HSC examination for the Extension 2 course. This question looks at vectors. The solution provided in this video demonstrates one way to unpack the question. There may be other methods and we encourage you to discuss alternative solutions with each other.

This question provides four pairs of vector equations of a line within a certain domain. We asked to determine which lines segments intersect at exactly one point. Please press pause now to read the question, and then we'll go through the solution together.

Let's take a look at option A. Each line segment we need to determine the start and end points for vector u. The starting point is given by the position vector one two which can be found when the value of Lambda is equal to zero. The endpoint can be found by calculating the vector equation when the parameter Lambda is equal to one. This gives zero five. Because one plus negative one is zero and two plus three is five. Similarly for Vector V, the starting point is given by the position vector of three one. And calculating the vector equation for Lambda equals one gives four two. It's obvious that option A does not provide a solution to this question.

Moving on to option B. The position vector gives us the starting point. one two And calculating the vector equation when Lambda equals to one gives us the endpoint. zero five In vector v, our starting, point is the position vector five seven. And the end point when Lambda equals one is eight negative two. Once again, it's obvious that they segments do not intersect.

Let's move on to option C For vector u a starting point is given by the position vector zero two The endpoint given by calculating the vector equation when Lambda equals to one. Gives two zero Now for Vector V, the starting point is given by the position vector zero three. And the end point when Lambda equals one gives one zero . We can see here that the lines intersect at exactly one point, so the correct answer is C.

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