

Risp 36: Teacher Notes

*Suggested use: to introduce **differentiation**.*

One of the big questions that A Level maths teachers have to face is:

“How should I embark upon the Calculus?”

Should we start with the 'first principles' approach? After trying lots of things down the years, I have come to the conclusion that it is better to begin with something practical, something that can be easily visualised. Here I ask students to work with gradients using Autograph to do all the hard work. First principles can always come later, by which time the weaker students will be feeling that this calculus thing is okay. If they then find the rigour of first principles too much, they will retain their first impression that the rules they have discovered more or less for themselves are straightforward to use.

In this risp we arrive at the rule for differentiating a power of x through pattern-spotting, which is not a million miles from the technique that Newton used right at the start of Calculus. I like the idea that as mathematics teachers we are trying to rerun the history of the subject inside our students' heads, only quicker! Maybe discovering the rule for differentiating x^n is such an important event in this history that this activity wins its place in an AS course where time is tight.

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